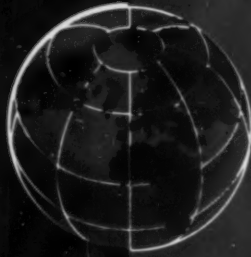


JULY, 1955 VOL. 17, NO. 6

# MINING WORLD



Uranium Metallurgy at  
Kerr-McGee's Plant

New Guides to  
Hidden Ore Deposits

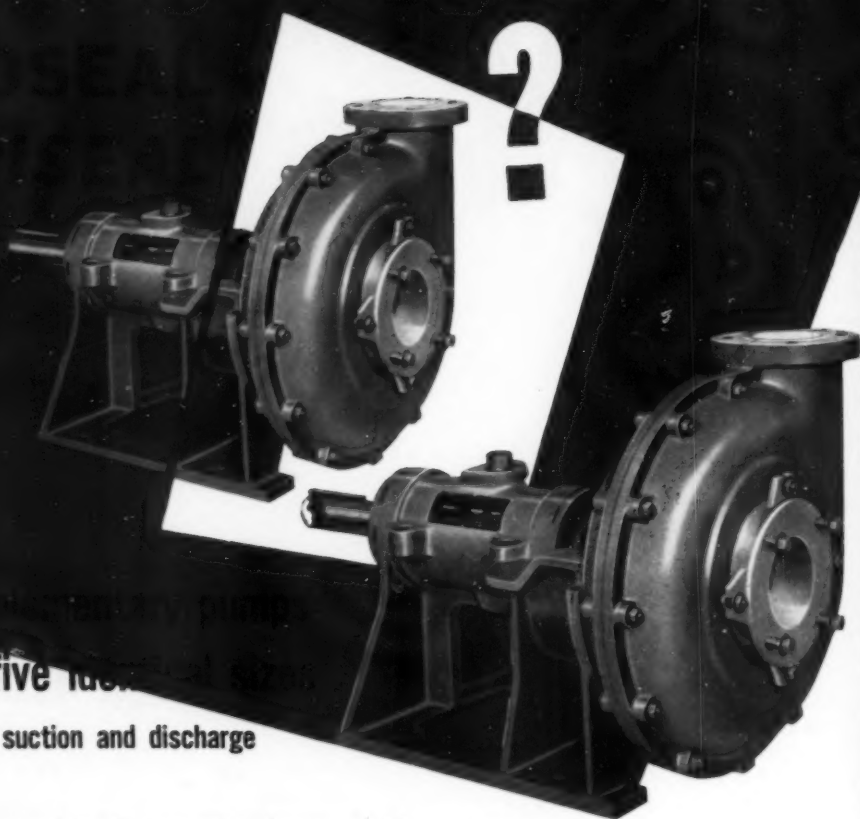


*Making Italian Lead-Zinc Pay*  
Page 54

50 cents a copy - 3s 6d in sterling

# Which slurry pump is the

# ?



A-S-H lines of interchangeable pumps  
now integrated in five industrial sizes

... ranging from 2" to 8" suction and discharge

**To** slurry-moving operations that can take advantage of the mechanical efficiency inherent in the Hydroseal Pump, yet in part must deliver pulp undiluted by sealing water, these interchangeable Hydroseal and Centriseal Slurry Pumps mean a new era in pumping technique and economy. Otherwise identical, only two parts are different—the Maximix Rubber impeller and engine-side shell half-liner. When operating purposes call for it, a Hydroseal Slurry Pump can be transformed into a Centriseal, and vice versa, with little more effort than it takes to change a tire.

**Hydroseals**, due to their gland-sealing feature, maintain their initial high efficiency up to the point Maximix Rubber replacements are needed. They save  $\frac{1}{3}$  to  $\frac{1}{2}$  in power costs, since over-size pump & motor allowance for wear is never required.

**Centriseals** are industrially efficient in moving abrasives, corrosives and acids where pulp must be delivered undiluted. As with Hydroseals, the moulded-to-shape Maximix Rubber parts are locked into position mechanically—no vulcanizing!

*In addition...*

there is the complete  
line of HYDROSEAL  
Sand & Dredge Pumps

Let us advise you in detail. Write us about your problem.

**THE ALLEN-SHERMAN-HOFF PUMP CO.**  
Dept. J—259 E. Lancaster Ave., Wynnewood, Pa.

Representatives throughout the World

# HYDROSEAL and CENTRISEAL

SAND, SLURRY & DREDGE PUMPS

MAXIMIX RUBBER PROTECTED



## You Get Your Round in Faster

... and lower your drilling costs with a  
**CLEVELAND Air Leg and Drill Combination**

Cleveland Air Legs and Drills have these important essentials — easier handling, higher drilling speed, and sturdy dependability — that enable your miners to increase the footage they can drill per man-shift.

**Here's why Cleveland Air Legs and Drills are easier to handle** — Only Cleveland gives you an air leg and drill with a built-in 11-position feed control. It eliminates a third hose and cumbersome "Y" connections, reducing the weight a miner has to handle. No feed-control bleed valve is required either so that the operator doesn't have to bleed off air continuously to maintain suitable feeding pressure. And a new, quick-opening steel puller makes steel changing easier and faster.

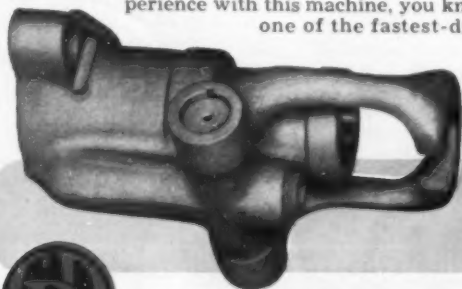
**Here's why Cleveland Air Legs and Drills have higher drilling speed** — First of all, the Cleveland Air Leg uses the Cleveland H-10 drill. If you've had any experience with this machine, you know it's one of the fastest-drilling

sinker drills made today. Then you have the built-in feed control that provides 11 feeding positions from zero to full-line pressure — with an increase of 9 psi at each setting. It lets the operator adjust the feed so that the drill is always down on the collar of the shank for maximum drilling speed, regardless of varying rock conditions.

**Here's why Cleveland Air Legs and Drills stay underground longer** — The Cleveland H10 drill is a proved performer, not only in the matter of drilling speed but also in upkeep cost. It's built to take it. And the Cleveland Air Leg holds the drill in line with the hole — thus reducing front-end drill wear and practically eliminating rotation strains. Moreover, the new steel puller helps to reduce maintenance costs still further. It consists of only five parts — there's only one spring and one plunger, and it's lubricated from the inside to prevent wear and to wash out dirt.

**Four types available** — There are four types of Cleveland Air Legs having conventional or telescopic, 3-ft., 4-ft., or 5-ft. feeds. Some models will take any 35-lb., 45-lb., or 55-lb. drill. Write for bulletin RD-30 that describes the Cleveland Air Leg in detail — the Air Leg that can help you get your rounds in faster for lower costs.

RD-30



Close-up view of new Cleveland Steel Puller. It consists of only 5 parts and has one spring and one plunger. Lubricated from the inside to assure easy operation and to flush out dirt, this new steel puller is also easy to assemble and disassemble.



**CLEVELAND ROCK DRILL DIVISION**

Westinghouse Air Brake Co.

12500 BEREA ROAD  
CLEVELAND 11, OHIO



This 180-W is building a levee for the Armour Fertilizer Works, Bartow, Florida. The 180-W swings a 5-yd. medium-duty bucket on a 120-ft. boom or a 4-yd. medium-duty bucket on a 135-ft. boom.

## BIG CAPACITY Digging Ability... Readily Moved From Job to Job

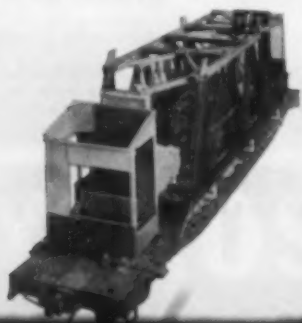
### BUCYRUS-ERIE **180-W** WALKING DRAGLINE

Mining and quarrying jobs need the economical, high-capacity dirt moving offered by Bucyrus-Erie walking draglines. The new 180-W has it plus unmatched ease in moving from job to job.

The 180-W is readily dismantled — only partial disassembly is necessary for moves. No main machinery components are disturbed; misalignment problems are eliminated. Ease of moving saves time and expense and greatly increases the 180-W's value throughout its life.

Along with its unusual portability, the 180-W brings to more jobs the dependable, big-output performance; quick maneuverability; long working range; and low maintenance costs that are traditional in every Bucyrus-Erie walking dragline. Send for complete information.

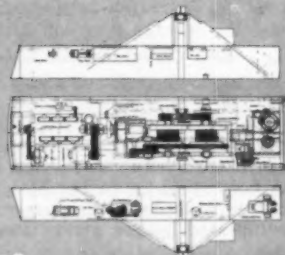
38L55C



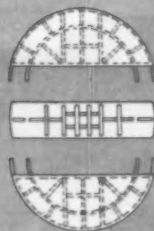
The operator's cab and center section of the revolving frame, loaded on a flat car for shipment, are shown here.

### FIVE U.S. RAILROAD CARS CARRY ENTIRE MACHINE

Side wings unbolt from center section of revolving frame. Main machinery remains fully assembled, stays in proper alignment.



Base is in three separate welded steel sections, joined by bolting flanges—easily disassembled and shipped.



**BUCYRUS  
ERIE**

South Milwaukee  
Wisconsin

1880 **75** 1955

YEARS OF SERVICE  
to Men Who  
Shape the Earth



# Mining World

Including the Export Edition WORLD MINING

Published monthly except in April when publication is semi-monthly

VOLUME 17

JULY 1955

No. 8

MINING WORLD	Page
Drifts and Crosscuts .....	37
Capitol Concentrates .....	39
The Musical Mountain by John D. Mitchell .....	60
U. S. Personalities in the News .....	61
Index of Advertisers .....	98
 WORLD MINING	
International Panorama .....	44
MINING WORLD Interviews Philippine President .....	45
Acid Cure: A New Process for U <sub>2</sub> O <sub>3</sub> at Shiprock .....	46
New Guides to Hidden Ore Deposits by Sigurd K. Herness .....	51
How Italy's Biggest Lead-Zinc Producer Plans for the Future by F. Cremascoli and P. Zuffardi .....	54
Money Making Methods .....	58
Newsmakers in International Mining .....	63
Fission Facts .....	65
International News .....	69
Metal and Mineral Prices .....	81
Production Equipment Preview .....	82

COVER PHOTO shows an Italian worker stacking high-purity zinc ingots at the Porto Marghera, Venice electrolytic zinc plant owned and operated by Montecatini S. I. P. Z. For the story of how this Italian producer plans future profits from lower grade ore reserves turn to page 54.

## PUBLISHING OFFICE

Emmett St., Bristol, Conn.

## EDITORIAL AND EXECUTIVE OFFICES

121 Second St., San Francisco 5, Calif., GARfield 1-5887

General Manager, San Francisco

M. F. Holsinger

Editor ..... George O. Argall, Jr.

Field Editor ..... Stanley Dayton

News Editor ..... J. M. Taylor

Assistant News Editor ..... J. Wolfe

Product Editor ..... B. A. McCurry

Production Manager .... J. A. Cheesman

Dist. Mgr., New York .... A. E. Roberts

Dist. Mgr., Chicago ..... R. N. Crosby

Assoc. Ed., Van. .... Charles L. Shaw

## BRANCH OFFICES

New York 17-370 Lexington Ave., Murray Hill 3-9295. Chicago 26-1791 Howard, Rogers Park 4-3420. Vancouver, B.C.-402 Pender St. West, MARine 7287.

## PUBLISHED BY

American Trade Journals, Inc.

Miller Freeman, President

L. K. Smith, Vice President

W. B. Freeman, Vice President

Miller Freeman, Jr., Sec.-Treas.

## STAFF CORRESPONDENTS

Africa: Accra, Gold Coast; Costermansville, Belgian Congo; Johannesburg, Union of South Africa; and Kitwe, Northern Rhodesia. Asia: Ankara, Turkey; Benares, India; Kuala Lumpur, Federated Malay States; and Tokyo, Japan. Europe: Frankfurt, West Germany; Helsinki, Finland; London, England; Madrid, Spain; Vienna, Austria; Paris, France; Redruth, Cornwall; Rome, Italy; Stockholm, Sweden; The Hague, Netherlands; and Trondheim, Norway. North and Central America: Mexico City, Mexico; San Jose, Costa Rica; and Vancouver, British Columbia. Oceania: Port Kembla, (N.S.W.), Australia. South America: Bernal, Argentina; La Paz, Bolivia; Lima, Peru; and Sao Paulo, Brazil.

Not responsible for unsolicited manuscripts.

Copyright 1955 by American Trade Journals, Inc.

Contents may not be reproduced without permission

## Mining World Subscription Rates

U. S. North, South and Central America	\$3.00
Other Countries .....	\$4.00
Single Copies .....	\$ .50
Directory Number .....	\$1.00

WORLD MINING is published the 26th of each month as a regular department of MINING WORLD and is also circulated as a separate publication on a carefully controlled free basis to a selected list of management and supervisory personnel associated with active mining enterprises throughout the world.



MILLER FREEMAN PUBLICATIONS



MINING WORLD, July, 1955. Volume 17, No. 8. Published monthly, except April, when publication is semi-monthly at Emmett St., Bristol, Conn. Executive, advertising and editorial offices, 121 Second St., San Francisco 5, California. Subscription in United States, North, Central and South America, \$3.00 per year; other countries, \$4.00 per year. Entered as second class matter Oct. 10, 1951 at the Post Office at Bristol, Conn., under the Act of March 3, 1879. Postmaster: please send notice 3579 to MINING WORLD, 121 Second St., San Francisco 5, Calif.

## GRAB SAMPLES From the Mail

### Brazilian Mining Problem

Dear Sir:

Apart from professional concern, as a mining engineer, the political and economic aspects of Brazilian mining, and the evolution of related legislation, have been a preoccupation of mine, for some years. Mr. Wright's article ("How American Mining Companies Can Now Operate in Brazil," by Charles Will Wright, MINING WORLD, February 1955, Page 56), particularly if more recent legislation is properly interpreted, presents a fairly accurate picture of circumstances. But of particular note is the failure to point out what is perhaps the most serious impediment to mining development in Brazil—that while the State grants the rights to explore and exploit, the land-owner has, by law, the prior right to do so.

You can understand that in a country where gold, diamonds, precious stones, tin, bauxite, and many other minerals have been produced by primitive methods for many years, that the most "ignorant farmer" in the State of Minas Gerais (which means "mines everywhere") is unlikely to be fooled by efforts of strangers to buy his land. . . . As you are well aware, prospecting and more advanced forms of exploration are the fountain-head and life-blood of mining everywhere, whether initiating or perpetuating the industry. While it may be quite reasonable that the land-owner should somehow participate in a development of "his" sub-soil, the step from discovery to a producing mine, is a very big one, and discoverers are all too often unable to offer enough immediate gain to the land-owner, whose imagination has been stirred by prospects of riches.

Mining itself, as Mr. Wright suggests, is not impeded. But its birth is likened to Caesarean, expensive, and discouraging to the parents. Once past the first few "days," it is likely to resemble other children.

SILVIO V. GUEDES

Chief Geologist

"Prospec"

Rio de Janeiro, Brazil

### Interesting and Well Done

Dear Sir:

I much appreciate WORLD MINING, for it is really interesting and well done.

I would like you to know that for the past several months I have been at the Cabernardi mine and would like you to change my address from the Manfredonia mine.

DOTTOR. INGEGNER ANDREA SCULCO  
Diretto Miniera Societa Montecatini  
Italy

### Help With Many Problems

Dear Sir:

We have found the WORLD MINING to be an excellent mining magazine from which we have derived information that has helped us with many of our problems.

A. W. POOLE

Assistant Mine Superintendent

Bralorne Mines Limited (NPL)

Bralorne, British Columbia

# NEW FROM CATERPILLAR!

**TWO MODERN,  
COMPACT,  
HEAVY-DUTY  
DIESEL ENGINES**



**THE NEW  
D342**

**190 HP**

**171 HP**

**152 HP**

This is the same trouble-free engine which powers Caterpillar's mighty D8 Tractor. Coming soon: the new D342 Electric Set!



**THE NEW  
D339**

**126 HP**

**112 HP**

**100 HP**

#### **INTERMITTENT OUTPUT**

Maximum recommended for loads of short duration (1 hour or less) with equal periods at idle or low load.

#### **RATED OUTPUT**

Maximum recommended for loads of moderate duration (12 hours or less) with equal periods at idle or low load.

#### **CONTINUOUS OUTPUT**

Maximum recommended for loads of unlimited duration.

All at 1200 r.p.m. with full equipment

Balancers—standard equipment on the new D339—give this powerful 4-cylinder engine all the smoothness of 6-cylinder performance!

Here are the latest advances in diesel engine design. Compared to other engines in their class, these two new CAT\* Engines offer you better operation, less maintenance, higher horsepower and more compact design. Take a quick look!

## CHOICE OF STARTING SYSTEMS!

### AIR

For fast starts where a supply of compressed air is readily available, a sturdy vane-type air motor is offered. Also available: air compressors and storage equipment.

### ELECTRIC

Where speed of starting is especially important. Also available: automatic start-stop controls which require no operating personnel.

### GASOLINE

For all-weather starting. This system preconditions the diesel, and supplies full lubrication before diesel is started. Also available: electric starters for the gasoline starting engine.

## ECONOMICAL FUEL SYSTEM!



Same famous tinker-free fuel system so successful on other Caterpillar Engines. Capsule-type injection valves with single, large, foul-proof orifices, plus special precombustion chambers, permit these engines to operate—even idle—on low-cost non-premium fuels. And full-flow filtering is assured with new paper-type element that is not affected by water.



## FIELD-TESTED PISTON ASSEMBLIES!



Pistons, rings and rods in these two new engines are like those used in Caterpillar's famous V-type Engines. Heat plugs, chrome-faced rings, cast-iron top ring bands give thousands of hours of operation before inspection is necessary.

## MANY OTHER IMPORTANT FEATURES!

### BRIEF SPECIFICATIONS

D342	Four-cycle, valve-in-head	D339
6	Number of cylinders	4
5 3/4 in. x 8 in.	Bore and stroke	5 3/4 in. x 8 in.
1246 cu. in.	Piston displacement	831 cu. in.
1200	Rated speed, r.p.m.	1200
425	Low idle speed, standard, r.p.m.	425

Your Caterpillar Dealer has full details on both of these compact, new engines. Call him today for modern heavy-duty diesels. And remember him, too, for prompt, complete installation and service.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill., U.S.A.

We'd be glad to send you more information on the new D342 and D339. Just mail the coupon below.

CATERPILLAR TRACTOR CO., Dept. 8594,  
Peoria, Illinois, U. S. A.

Send me complete details on the new D342 and D339.

Name \_\_\_\_\_

Address \_\_\_\_\_

City \_\_\_\_\_ State \_\_\_\_\_

# CATERPILLAR\*

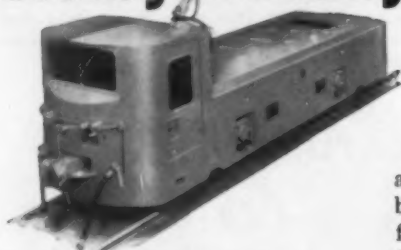
\*Both Cat and Caterpillar are registered trademarks—(C)

THE D342 AND D339—LATEST  
EXAMPLES OF CATERPILLAR  
LEADERSHIP IN ACTION



Eight-ton Jeffrey locomotive working in iron ore mine. Note massive construction and end frame protection.

## Jeffrey Trolley Locomotives improve metal mine haulage



Jeffrey 15-ton ore mine locomotive. Enclosed cab offers weather protection for motorman on outside portion of haul and protection from roof falls on inside.



Six-ton Jeffrey ore mine locomotive. Rounded, welded end frames and smooth side frames with no projecting parts are desirable safety features.

Protection against "down time" and accidents to personnel are just two of the ways Jeffrey power-packed trolley locomotives benefit metal mine operations. For example, electrical equipment is fully shielded from water dripping from the roof or splashing up from the track. Gable-type covers with center channel provide drainage. Rounded end frames, the same height as side frames, protect motorman and trip rider.

Features like these can be built into any of Jeffrey's complete line of four-wheel metal mine locomotives in 4, 6, 8, 11, 15 and 20-ton sizes, and the eight-wheel 27-ton unit. The line spans the narrow gauge field—24", 30" and 36".

Jeffrey trolley locomotives are sturdy, streamlined, easy to operate and repair. Throughout the mining world they haul high tonnage at low cost and are well known for reliability and long-term service.



# THE JEFFREY

ESTABLISHED 1877  
**MANUFACTURING CO.**

Columbus 16, Ohio

*sales offices and distributors  
in principal cities*

**IF IT'S MINED, PROCESSED OR MOVED  
...IT'S A JOB FOR JEFFREY!**

**PLANTS IN CANADA, ENGLAND, SOUTH AFRICA**



# BOYLES BROS.

DRILLING COMPANY LTD.

Vancouver, Canada

announce the appointment of

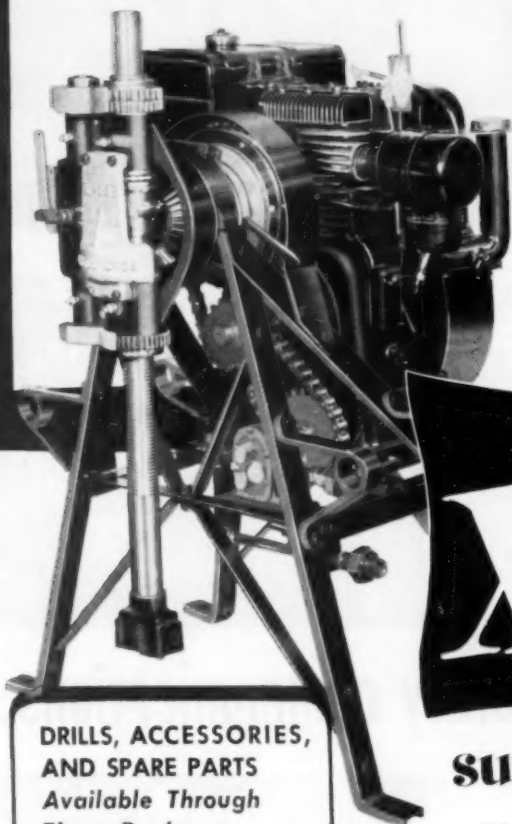
## STANCO

MFGS. and SALES INC.

1931 Pontius Ave.

Los Angeles 25, California

as exclusive Distributors  
in the 12 Western States



for the  
**X-RAY**

## surface diamond drill

**DRILLS, ACCESSORIES,  
AND SPARE PARTS**  
Available Through  
These Dealers...

GEHRING EQUIPMENT CO.  
Casper, Wyoming  
ASCO Co.  
Cheyenne, Wyoming  
UTAH BIT & STEEL  
Midvale, Utah  
S & M MACHINERY  
Grand Junction, Colorado  
PACIFIC MINE & MILLING CO.  
Fresno, Calif.  
PRECISION Co.  
Los Angeles, Calif.  
L & L EQUIPMENT CO.  
Los Angeles, Calif.  
J. D. COGGINS Co.  
Albuquerque, New Mexico  
J. E. MORTON Co.  
Abilene, Texas  
CAL.-ORE. MACHINERY CO. INC.  
Medford, Oregon  
MINE AND MILLING SUPPLY CO.  
Los Angeles, Calif.

This light weight (205 lbs. net), compact, portable diamond drill is unrivalled for exploration work. Takes 3/4" core—1-3/16" hole to 200 ft. and 7/8" core 1-1/2" hole to 100 ft. *Economical too*... in first cost and day to day operation. Normal fuel consumption less than 3 gallons (U.S.) per 8 hour shift. See your dealer now.



**BOYLES BROS**  
DRILLING COMPANY LTD.  
VANCOUVER, CANADA

# Boosts haulage efficiency and increases safety...

## M-S-A MinePhone

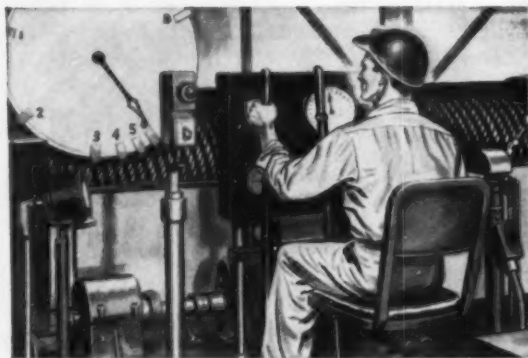
The M.S.A. MinePhone is eliminating communication delays in mines everywhere. This clear, instant two-way voice communication system coordinates the wide variety of operations vital to peak production. Haulage moves faster because dispatcher and motormen are constantly in touch, even while trips are in motion. Shop and maintenance personnel are always "on call." And because messages are relayed instantly, on an open-line hookup, underground safety is increased. Write for details.



# Assures accurate, safe, speedy hoisting operations...

## M-S-A HoistPhone

The M.S.A. HoistPhone provides continuous, dependable and efficient voice communication between hoisting engineer and cage, at any level, and when in motion. The system is invaluable in emergencies, yet designed for day-in-day-out service. Ideal for passenger travel, load leveling, inspection trips, and construction work, the HoistPhone requires no special training; utilizes existing wiring. Write for complete details.



# Permits emergency or temporary communications...

## M-S-A Portable HoistPhone

A compact, integral unit that can be set up anywhere, and put into immediate service for clear, dependable voice communications. Its light weight and ease of operation make it ideal for temporary communications for inspection work or for emergency assignments. Write for details.



When you have a safety problem, M.S.A. is at your service.  
Our job is to help you.

### MINE SAFETY APPLIANCES COMPANY

201 North Braddock Avenue, Pittsburgh 8, Pa.

At Your Service: 77 branch offices in the  
United States and Mexico

### MINE SAFETY APPLIANCES CO. OF CANADA, LTD.

Toronto, Montreal, Calgary, Edmonton, Winnipeg,  
Vancouver, Sydney, N.S.



## How rubber-tired tractors cut costs for one of world's largest titanium mines

In the heart of the Adirondack Mountains in upper New York State lies a mine which is one of the world's largest producers of titanium. From a pit 900 ft. x 1,800 ft. comes 3,200,000 tons of ore and waste yearly. Two rubber-tired Tournatractors shuttle back and forth to handle tractor work at pit, stockpiles, and plant.

**1 tractor cleans around 3 shovels, 1 dropball, 11 trucks**  
One of these 19 mph 208 hp units is assigned mainly to pit and dump clean-up. At the pit, it cleans around two 2½-yd. shovels, seven ore-hauling trucks, one 4-yd. shovel, and a rubber-tired dropball crane. At the dump, a mile away, it cleans up for a fleet of 4 end-dump trucks. Rig shuttles continuously between assignments. A 300 ft. trip between shovels takes as little as 20 seconds...the mile from pit to dump takes 3 to 5 minutes. Despite this busy schedule, tractor finds time to move air compressors, drills, and other pieces of pit equipment.

**Another dozes magnetite weighing 4800 lb./yd.**

The second Tournatractor is used primarily on the magnetite stock-

pile. Here it dozes concentrate within range of clamshell that loads railroad cars, or else dozes directly into a hopper. Rig's blade often carries 2½ cubic yards of material — weight 6 tons! When needed, this tractor moves to other stockpiles to doze ilmenite concentrate or coal. Occasionally, it spots railroad cars in the sintering plant area. As needed, it cleans spillage from roads and haulage ways, and does other odd jobs. Wherever it goes, rig's low-pressure tires do no damage to footing. They roll easily over pavement, railroad tracks and ties.

**Each costs \$1 less per hour to operate than crawler-tractors**  
On shovel clean-up jobs, owners report Tournatractors outproduce the biggest crawler-tractors, 2-to-1. Units usually work at higher speeds and move job-to-job at higher speeds. Tournatractors cost less to maintain, too...4 tires eliminate the headaches of 500 to 600 track parts. Lowered maintenance, plus lower repair and operating costs are proved by accurate figures kept by the mining company. These show cost to operate Tournatractor "averages" approximately \$1.00 less per

One of the nation's major sources of titanium, this open-pit has produced 15,000,000 tons of ilmenite-magnetite ore and 8,700,000 tons of concentrates since its start in 1942. Over 17,000,000 tons of rocky overburden have also been removed. Entire deposit is 1800 ft. long, 900 ft. wide; averages 35% magnetite, 32% ilmenite, 10% feldspar and 23% iron silicates. All ore and waste must be shot...drill holes are sunk with a 42-T churn drill using a 9 inch bit, to 39 ft. deep. From 350 to 500 lbs. of 90% gelatin dynamite are used per hole...each lb. breaks up 3½ tons of waste and ore. A 4-yd. shovel, together with four 22-ton rear-dump trucks, loads all waste...two 2½-yd. shovels, together with seven 15-ton trucks, move the ore. Finished ilmenite goes to processing plants, for conversion into titanium dioxide pigments for paints, paper, rubber, ceramics, and other substances. Magnetite concentrate is shipped converted to sinter and shipped raw to various iron, steel, refractory, and cement plants.

*hour than their records of average cost for crawler-tractors.*

### You judge its advantages

Tournatractor's lower costs, "go-anywhere" mobility, and fast-working speeds can pay off for you, too! Ask your LeTourneau-Westinghouse Distributor for a demonstration of this versatile machine so you can judge its advantages for yourself!

Tournatractor—Trademark Reg. U.S. Pat. Off. T-752-M-bw

Dozing stockpiled magnetite, Tournatractor moves up to 2½ bank yards (about 6 tons) per push.



**LeTourneau-Westinghouse Company**

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

beryllium

columbium

uranium

iridium

hafnium

tantalum

thorium

titanium



## into the JET AGE...

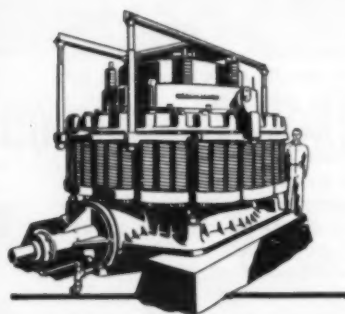
### Rarer Elements now serve the Men of Science

☆ As man crashes through the sound barrier, we find new words being used to describe the miracles wrought by today's men of science and research . . . words like *electronics—guided missiles—nuclear fission—transistors.*

Helping to make these scientific advances possible are the technical skills and vast experience of the mining industry, now being utilized to develop the rarer elements. Rocks and minerals formerly of no commercial interest have thus come into production . . . including *aplite, nepheline, syenite, olivine, perlite, pinite, topaz,* and many more.

Uses of these elements are numerous—ranging from modern construction to radar, sonar, and jet aircraft parts . . . but most of them have one thing in common . . . they are being processed by SYMONS® Cone Crushers—the machines that revolutionized crushing practice.

NORDBERG MFG. CO., MILWAUKEE, WIS.



SYMONS Cone Crushers are built in Standard, Short Head, and Intermediate types, with crushing heads from 22 inches to 7 feet in diameter—in capacities from 6 to 900 tons per hour.

SYMONS . . . A REGISTERED NORDBERG  
TRADEMARK KNOWN THROUGHOUT THE WORLD

© 1955, Nordberg Mfg. Co.

C255



# NORDBERG



MACHINERY FOR PROCESSING ORES and INDUSTRIAL MINERALS

NEW YORK • SAN FRANCISCO • DULUTH • WASHINGTON  
TORONTO • MEXICO, D.F. • LONDON • JOHANNESBURG



Symons  
Gyratory  
Crushers



Grinding Mills



Mine Hoists



Symons  
Vibrating  
Grizzlies  
and Screens



Diesel Engines





After 50 years of mining, not much is left of Kiirunavaara, the larger of the iron mountains. Its top ridge, originally 750 ft. high has been excavated until it has become a gorge 11,000 ft. long and 1,350 ft. wide. Terraces of waste rock cover the rest of Kiirunavaara.



## Hauling 8,500,000 tons of iron ore yearly

*Owner calls these Rear-Dumps "Most economical, most rugged machines we have ever used"*

Near Kiruna, Sweden, 90 miles north of the Arctic Circle, stand two mountains of iron ore, "Kiirunavaara" and "Luossavaara". They represent two of the most valuable mineral deposits in the world, outstanding both for high iron content and for size.

At present, the two mountains yield 8,500,000 tons of iron ore every year. Thirty trainloads are shipped daily, most of them destined for export to U.S.A., England, and Germany. Within the next ten years, output will be increased to 12,000,000 tons of ore annually.

### "D" Rear-Dumps haul from pit to crusher

To help reach this production goal, the contracting firm, Broderna Holm, of Ojebyn, Sweden, purchased 2 Model D Rear-Dump Tournapulls to haul from mine to crusher. Under present schedules, the ore is blasted twice a day. After the smoke and dust have cleared, material is shovel-loaded into the Tournapulls for a 1575-ft. uphill haul to the crusher. Despite grades to 10%, average cycle takes 9 minutes. Of this, 3 minutes is used for loading. Each Tournapull delivers 5 to 6 loads (55 to 66 tons) per 50-minute hour.

This output has been maintained both in the summer, when haul roads are rocky and abrasive, and in winter when snow makes footing treacherous. Tournapulls easily overcome both difficulties; their big low-pressure tires provide good traction on the icy surfaces, plus cushioning for hauling over rock without damage.

### "Not one day's downtime!"

Tournapull Rear-Dumps also eliminate entirely such trouble sources as body frames, sub-frames, springs and hydraulic systems. Yngve Holm, one of the owners of Broderna Holm says, "Tournapull Rear-Dumps are the most rugged and most economical machines we have ever used. We have had no downtime in over 1,400 hours of double-shift work in 5 months."

If your work involves hauling rock, or other shovel-loaded material, Tourn-

apulls can mean greater output at lower cost to you, too. There is a Rear-Dump size to fit your needs — 9, 18, 35 and 50 tons. Purchases can be made for pounds sterling or U.S. dollars. Call or write for all the facts.



Mine output is limited by the crusher capacity. Tournapull Rear-Dumps must dump their loads into the hopper in two operations to avoid choking. The mine, Luossavaara Kiirunavaara Aktiebolag, is located 1,500 ft. above sea level, just below the timber line. Work is possible here in winter, because the Gulf Stream warms the winds blowing from north and west, while the mountains of Norway extract much moisture from the air.

Tournapull — Trademark Reg. U.S. Pat. Off. DR 527-M-B

## LeTourneau-Westinghouse Company

PEORIA, ILLINOIS

A Subsidiary of Westinghouse Air Brake Company

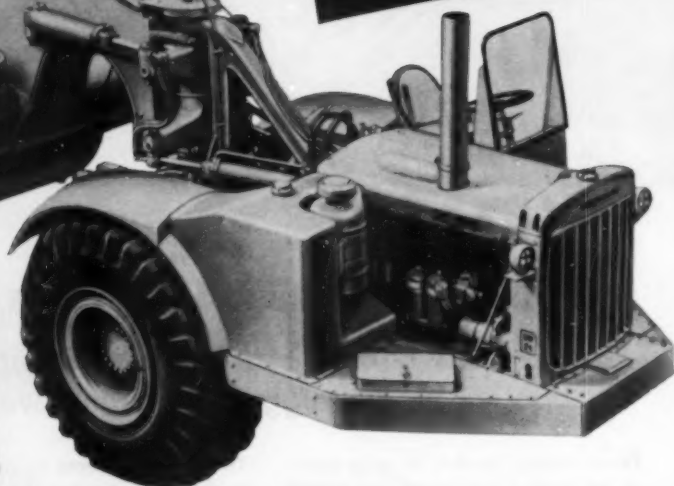
CATERPILLAR ANNOUNCES THE

# New DW20-DW21 TRACTORS



**BIGGER CAPACITY**  
**18 CU. YD. STRUCK**  
**25 CU. YD. HEAPED**

**MORE POWER**  
**300 HP**



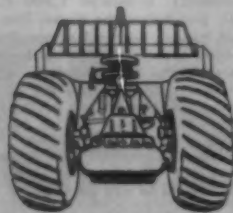
The new two-wheel CAT® DW21 Series C with new No. 470 LOWBOWL Scraper. The new four-wheel DW20 Series E is available with the new No. 456 LOWBOWL Scraper, or the new W20 Wagon. Wagon capacity—20 cu. yd. struck.

## "BIG PRODUCTION" FEATURES OF THE NEW DW20-DW21

**MORE POWER—300 HP** at 1800 r.p.m. Ten per cent more rimpull. New 6-cylinder,  $5\frac{1}{4} \times 6\frac{1}{4}$  inch Caterpillar Engine. Requires only one operating adjustment. Has hydraulic valve lifters—fan belt tension regulated by convenient capcrew-adjustment of generator.

**NEW TURBOCHARGER**, driven by engine exhaust, utilizes energy which would otherwise be lost. Packs air into engine according to engine load, not speed. Delivers more working HP—greater performance.

**NEW, BIG WIDE-SECTION 29.5-29 TIRES**, developed after 3 years of Caterpillar and tire manufacturer research, have proved a success in extensive tests on actual earth-moving jobs. Operating at lower pressures and providing big-footprint flotation and wide-lug traction, they're standard on the new DW20-DW21. Optional—24.00-29 tires.



**INCREASED HIGH APRON LIFT** provides faster ejection of any material.

**INCREASED SCRAPER GROUND CLEARANCE** enables units to work even under extremely "soft" conditions.

### HIGH SPEEDS FOR FAST HAULS:

DW20 (Series E), 2.8 to 32.1 m.p.h.  
DW21 (Series C), 2.3 to 30.5 m.p.h.

**CHOICE OF STARTING METHODS**, optional 24-volt direct electric or gasoline starting engine with 6-volt starting motor.

**LARGE AREA PUSHBLOCK** gives better pusher contact, faster loading.

**AUTOMATIC CABLE SAVER** standard equipment.

*Plus improved brake control, more easily removed DW20 hitch arrangement, better protected DW21 hydraulic steering system and many other new and thoroughly tested Caterpillar features.*

...AND THE NEW

# LOWBOWL SCRAPERS

Cat DW20 and DW21 Tractors and their matched scrapers have won world-wide acceptance as the standard of money-making performance among earth-moving haulers.

Now Caterpillar offers you two new pace-setting machines in the DW20 Series E and the DW21 Series C and their matched scrapers with exclusive **LOWBOWL** design.

Everything about these high-speed, high-capacity rigs contributes to BIGGER production. The new **LOWBOWL** design of the scrapers

utilizes tractor and pusher power at maximum efficiency. The result: bigger loads and faster loading times. Feature after feature, many of them described briefly here, add up to a new profit-making potential for users. Get the full facts from your Caterpillar Dealer.

Caterpillar Tractor Co., San Leandro, Calif.; Peoria, Ill., U.S.A.

## CATERPILLAR\*

\*Both Cat and Caterpillar are registered trademarks—(C)

**NEW DW20-DW21  
—GIANT EARTHMOVERS**

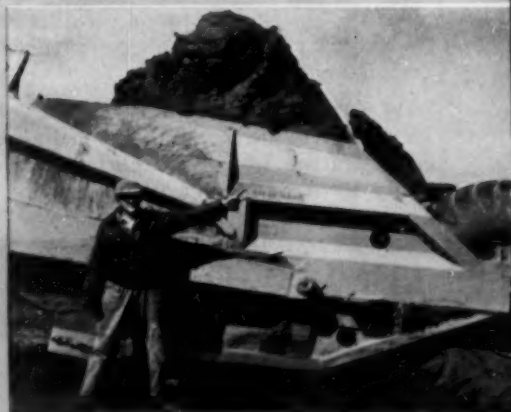
### HOW LOWBOWL DESIGN PAYS OFF IN BIGGER, FASTER PAYLOADS



New No. 470 Scraper with **LOWBOWL** design

Both scrapers were loaded with the same material obtained under identical conditions. Result: in the No. 470 a net load weighing 5000 pounds greater than the load in the No. 21—a profitable margin for **LOWBOWL** design!

Both No. 470 and No. 456 feature this new concept. The bowl has been widened and lengthened, yet bowl depth has been lowered. Horsepower is utilized more efficiently. Material is loaded with less resistance clear out to the end of the loading cycle. Result: faster loading for **LOWBOWL** design!



Sideboarded No. 21 Scraper

**ANOTHER EXAMPLE OF CATERPILLAR LEADERSHIP IN ACTION**



# Uranium Production Increased... Kerr-McGee Completes New Plant at Shiprock in Record Time

**The Navajo Uranium Division** of Kerr-McGee Oil Industries Inc., Shiprock, New Mexico, began operation November 1, 1954, at a tonnage greatly exceeding its planned capacity.

WKE Division of Western Machinery Company was given the go ahead on initial construction of buildings and facilities just nine months before final completion.

**NEW Flowsheet.** The carefully developed flowsheet, incorporating the new acid cure method of uranium concentration, was given constant and continuing study by Kerr-McGee metallurgists, the AEC,

Navajo Uranium plant personnel and by WKE engineers. The result was optimum utilization of equipment and facilities for maximum recovery from the wide variety of ores submitted for treatment.

**Progressive Engineering Pays Off.** The new process necessitated progressive engineering and many problems impossible to foresee were worked out during design and construction, thus producing a better mill in record time.

The new \$3,000,000 Kerr-McGee plant constructed by Western Knapp Engineering incorporates the latest methods for extraction of uranium concentrates. Every modern metallurgical facility has been engineered into this model custom mill.



## W.K.E.

WESTERN KNAPP ENGINEERING CO.

DIVISION OF WESTERN MACHINERY COMPANY  
760 Folsom Street • San Francisco 7 • California



# Record Tonnage Produced at Navajo Uranium Division

**WEMCO Equipment  
Resists Highly Abrasive  
and Corrosive Treatment**

The new \$3,000,000 plant built for Navajo Uranium Division of Kerr-McGee Oil Industries selected equipment on the basis of resistance to highly abrasive and corrosive conditions.

This new uranium plant at Shiprock, New Mexico, utilizes an acid cure flowsheet new to uranium processing. While much of the process is highly secret, it is well known that the corrosive acid content is high and damaging to equipment. Also, the fast settling coarse sands create an abrasive action which constantly exposes new surfaces to the adverse effects of corrosion.

## **Wemco Equipment in Flowsheet**

Following grinding and screening, the liberated uranium ore is processed for repulping through WEMCO rubber covered agitators producing a pulp approximately 50% solids.

From the WEMCO Agitators the pulp flows through four WEMCO Spiral Classifiers in the modified CCD system for sand-slime separation. Exposed rotating parts of the classifiers are stainless steel with the spiral flights and tanks rubber covered to resist acid and abrasion. Acid proofing of the classifiers, including the submerged bearings and spirals, has been 100% effective. Flights can be added changing the classifiers from single to double or triple pitch if additional capacity is desired.

Underflow from the thickeners is handled in special acid resistant WEMCO Diaphragm Pumps. These pumps are designed for ease of maintenance and handling, with replacement of wearing parts reduced both in time and in frequency.

Precipitation of the final product utilizes specially developed WEMCO Agitators in part of the flocculating process.

**WEMCO**  
WESTERN MACHINERY COMPANY

760 Folsom Street • San Francisco 7 • California

Representatives in principal U.S. cities, in Canada and worldwide



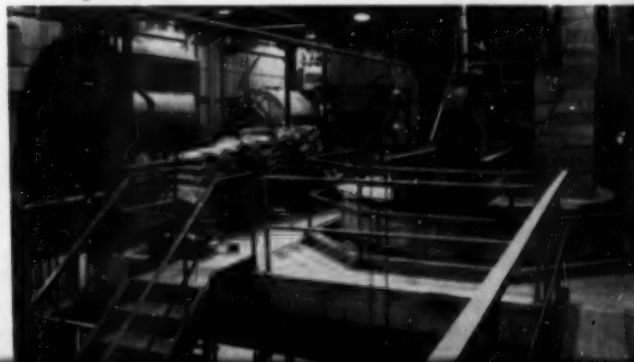
Wemco Diaphragm Pumps handling thickener underflow are simple to adjust and service.

New \$3,000,000 Uranium producing mill of Kerr-McGee at Shiprock, N.M. built by WKE Division of Western Machinery Company.



Acid-abrasion resisting Wemco Spiral Classifiers eliminate approximately 60% of barren sands in the modified CCD system of Navajo Uranium.

Repulping, conditioning and part of the precipitation is handled in special Wemco Agitators.



# TIREX



Shovels biting and tearing at rocky ore — straining and groaning as the dipper comes up — are dramatic proof that all is well with the shovel's trailing cable and the distribution system behind it. Feeding the insatiable appetites of these monster shovels is an undertaking of no mean proportions. It means using cables that are utterly dependable even under the most trying conditions. That is merely another way of saying that all of your shovels should be equipped with TIREX Shovel Cables.

If this shovel and its team of trucks are down even for a few hours, due to cable failure, the increased overhead will be far in excess of the cost of a new cable.

For this reason, we say that price and all other considerations, except operating dependability, are of no substantial consequence. The important point to you is the cost-per-ton of ore mined, not the cost-per-foot of shovel cable.

To keep your cost-per-ton of ore mined down to the lowest possible figure, be sure you equip your shovels with cured-in-lead, Selenium Neoprene Armored TIREX Shovel Cables. They will be on the job long after you've forgotten what they cost.

# Simplex

## TIREX

CORDS AND CABLES

are made only by the

**SIMPLEX WIRE & CABLE CO., 79 Sidney St., Cambridge 39, Mass.**



# *Cyanamid* **REAGENT NEWS**

*"ore-dressing ideas you can use"*

## **AEROMINE® 2026** *Cationic Promoter* *Now Available*

Tested, proven and now regularly used at Cyanamid's own Florida phosphate operations, AEROMINE 2026 is now available to other users of cationic promoters.

Product of several years intensive research, AEROMINE 2026 is used at several Florida phosphate plants for removing silica. A bulk concentrate comprising phosphate rock and silica is made by flotation with a crude fatty acid collector, (such as AERO® Promoter 708). Concentrates are then washed with a dilute sulfuric acid solution to destroy the fatty acid collector coating the mineral particles. Finally, the silica is floated off with the cationic collector, AEROMINE 2026 Promoter, leaving behind a high-grade phosphate rock product.

AEROMINE 2026 has also shown promise on non-metallic operations making a separation of feldspar and silica. Used in a hydrofluoric acid circuit, it selectively floats feldspar away from quartz.

AEROMINE 2026 is a dark brown paste with an ammoniacal odor. Like other cationic collectors it has some frothing properties. It can be fed as a 5 to 10% solution in water, kerosene, alcohol or a frother.

We will be glad to furnish samples of this reagent for laboratory evaluation and to discuss its use with you. A post card or letter to our office in New York will bring a prompt reply.

\*Trade-Mark

## **AMERICAN** *Cyanamid* **COMPANY**

**MINERAL DRESSING DEPARTMENT**

30 ROCKEFELLER PLAZA, NEW YORK 20, N. Y.  
Cable Address — Limanitra, New York

NORTH AMERICAN CYANAMID LIMITED  
Royal Bank Bldg., Toronto 1, Ontario, Canada  
CYANAMID DE MEXICO, S. A.,  
Apartado No. 26012, Mexico 12 D. F., Mexico

CYANAMID PRODUCTS, LTD., Bush House,  
Aldwych, London W. C. 2, England  
SOUTH AFRICAN CYANAMID (PTY.) LTD.,  
P. O. Box 7552, Johannesburg, Union of South Africa

E. P. CADWELL, Casilla 12983,  
Correo 11, Santiago, Chile  
G. B. O'MALLEY, MALCOLM GLEN,  
377 Little Collins St., Melbourne C. 1, Australia



# 6 miles of "know-how"

offer a short-cut to profitable thermo-processing



## OVER 150 TRAYLOR KILNS are your best assurance of an efficient installation

Traylor has built over 150 Rotary Kilns since 1941 . . . an average of almost one a month for 14 years. Their combined length is over 33,000 feet. This adds up to more than 6 miles of kiln building "know-how" for Traylor.

Kilns have been "Traylor-made" for processing some 21 different products. The answer to many new thermo-processing problems has been found in Traylor's accumulation of kiln-building experience. If you are responsible for efficient thermo-processing in your plant, take the short cut to a profitable installation. Avoid the long costly way of trial and error. Have a kiln "Traylor-made" for the job. Write for bulletin 1115 today.

**TRAYLOR ENGINEERING & MFG. CO.**

763 Mill St., Allentown, Pa.

Canadian Mfrs.: Canadian Vickers, Ltd., Montreal, P. Q.



PRIMARY  
GYRATORY CRUSHERS



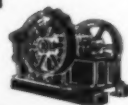
ROTARY KILNS,  
COOLERS, SLAKERS

SECONDARY  
GYRATORY CRUSHERS



GRINDING MILLS

JAW CRUSHERS



APRON AND  
GRIZZLEY FEEDERS

SEND FOR BULLETINS  
... just mention the Traylor  
Equipment that interests you.

SALES OFFICES • NEW YORK • CHICAGO • SAN FRANCISCO





H. F. Mills, manager, Iron King Mine, Humboldt, Arizona

## *"Excellent results with Drillube at Iron King"*

"We have been getting excellent results with Union's Drillube here at the Iron King Mine.

"For the past 10 years its use has helped to keep stopers, drifters, and jackhammers in top operating condition.

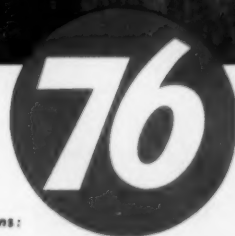
"We have found that Drillube effectively seals abrasive sludge out of the working parts, lessens wear on pistons and chucks, with consequent decrease of air leakage and

blowby. We also find but very little fogging of air from oil in the drifts and stopes."

Especially engineered by Union Oil Company for air pressure lubrication, Drillube has proved remarkably successful in mining and quarrying operations throughout the Western United States and Alaska. Your local Union Oil representative can supply you.



**UNION OIL COMPANY**  
OF CALIFORNIA



Los Angeles: Union Oil Bldg. • New York: 45 Rockefeller Plaza • Chicago: 1612 Bankers Bldg. • New Orleans:  
644 National Bank of Commerce Bldg. • Atlanta: 401 Atlanta National Bldg. • Kansas City, Mo.: 612 W. 47th St.



## THIS AMSCO® LIP TAKES A SHARPER BITE

... chews out full loads at normal power

The lip juts way out where it easily bites up—and delivers—the full yardage of rock or earth. It's a sharp *extension* of the dipper, with fanned teeth—for fast, easy penetration. The dipper digs out a heavier load without strain on the shovel . . . even requires less power, and prolongs life of all parts.

This Amasco lip lasts a long, long time, because it's made of the toughest steel known—manganese steel—the metal that work-hardens to fight off wear by impact and abrasion. Lip replacement is simple, when necessary, keeping downtime short.

If getting more pay loads moved faster with less wear on equipment means more profits to you, specify *Amsco Renewable Lip Dippers*.

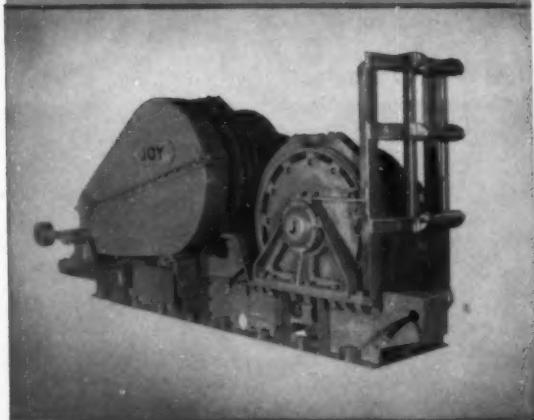


**AMERICAN MANGANESE STEEL DIVISION**  
Chicago Heights, Ill.

One of  
each size



5HP—The S-211, the Mighty Mite of the Joy Slusher Family.



150 HP—For rugged, heavy-duty operation, you'll never beat the giant Joy XT-221 Slusher.

## The **JOY** *Complete* Family of Slushers

From the Mighty Mite . . . the S-211 . . . to the giant XT-221 is a big jump but there are many, many rugged, efficient sizes of Joy Slushers in between that bridge the gap smoothly, completely. You're sure to find one sized exactly right for your job. Here's a representative list:

- 5 HP—S-211
- 7½ or 10 HP—FF-211 and FF-311
- 15 to 25 HP—A2F-211 and A2F-311
- 20 to 40 HP—B2F-211 and B2F-311
- 30 to 75 HP—C2F-211 and C2F-311
- 100 and 125 HP—R-221, RF-211 and RF-212
- 150 HP—XT-221 and XT-222

All of the more than 300 types and sizes of Joy Slushers have these features which assure low maintenance and operating costs: Large drum diameters for longer rope life; easily removable clutch bands; simple, rugged construction; special water-proof, dirt-proof bearings; and rugged steel frames.

Remember, there is not a scraping job anywhere that can't be efficiently handled with a Joy Slusher. Consult a Joy Engineer for the size and type best for your scraping job. **Joy Manufacturing Company, Oliver Building, Pittsburgh 22, Pa.** In Canada: **Joy Manufacturing Company (Canada) Limited, Galt, Ontario**



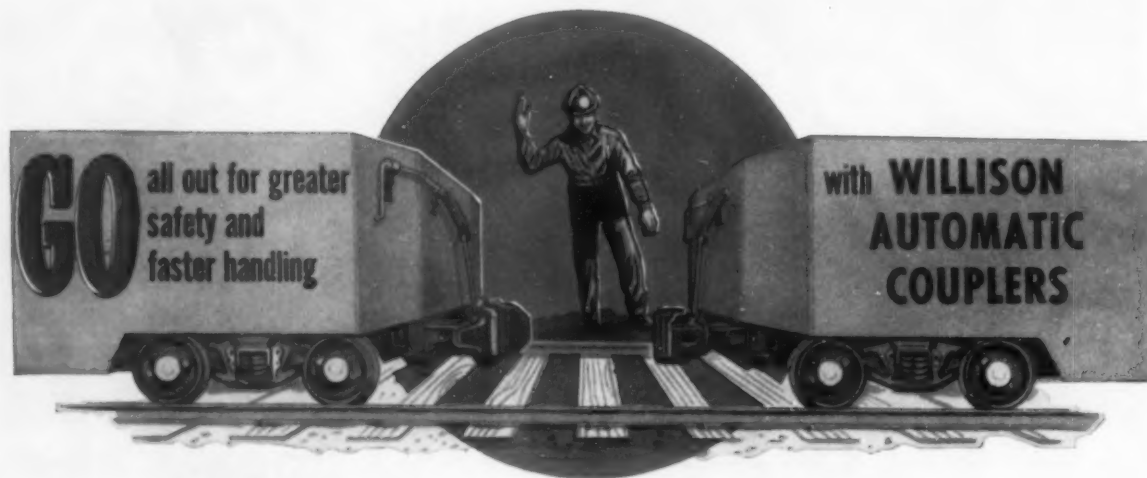
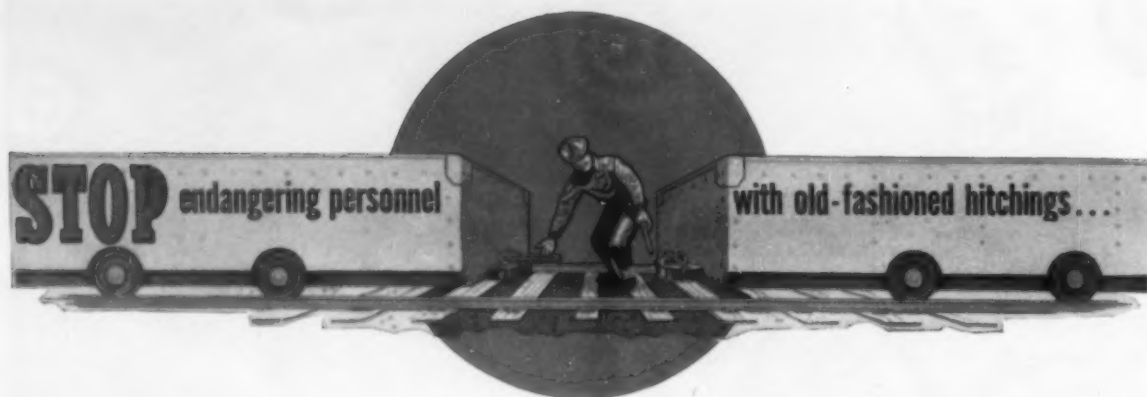
*Consult a Joy Engineer*

for AIR COMPRESSORS, ROCK DRILLS,  
HOISTS AND SLUSHERS

# JOY

WORLD'S LARGEST MANUFACTURER OF  
UNDERGROUND MINING EQUIPMENT

W&M 5467



With Willison Automatic Couplers there's no need for personnel to go between cars to couple or uncouple. That means safety—and faster handling because Willisons uncouple from either side. All Willisons couple with each other automatically—there's no matching of coupler heads.

*For safety, faster handling and larger tonnages—Willison Automatic Couplers and National Multi-Pad Rubber Draft Gears.*

A-9031



## NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

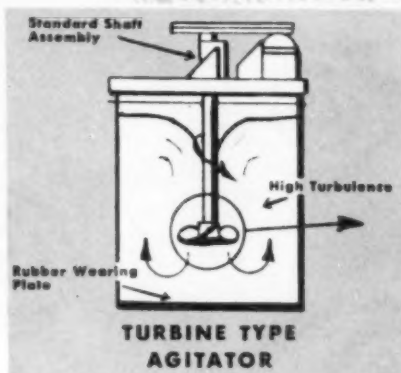
Cleveland 6, Ohio

WILLISON AUTOMATIC COUPLERS • RUBBER & FRICTION DRAFT GEARS • NC-1 CAR TRUCKS  
NACO STEEL WHEELS • NACO STEEL LINKS & SWIVEL HITCHINGS





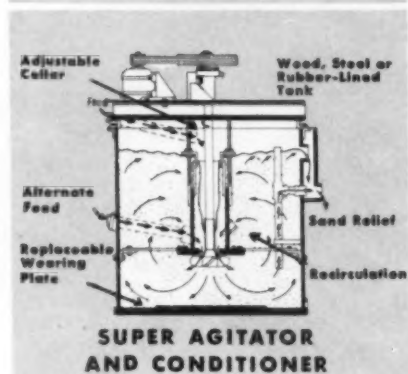
# Here are the tools to help you solve your Agitation problems and *Increase Profits!*



## DENVER Agitators for mixing and leaching

(Copper, uranium, vanadium, lithium, cobalt, zinc)

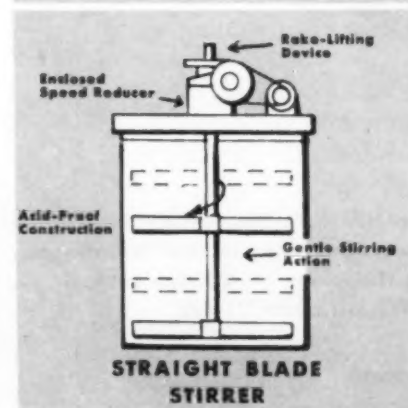
Denver Agitators and Conditioners are the only machines that are flexible enough to be adapted to meet changing ore conditions. Heavy duty construction gives you dependable service 24 hours a day!



## DENVER Agitators for flotation

(Barite, phosphate, fluorspar, iron, lead, zinc, copper feldspar)

The patented Denver standpipe gives you a flexible tool to change agitation and aeration to meet your exact requirements. These fool-proof machines will mechanically do your job—low maintenance.



## DENVER Agitators for precipitation

(Vanadium, lithium, uranium, copper)

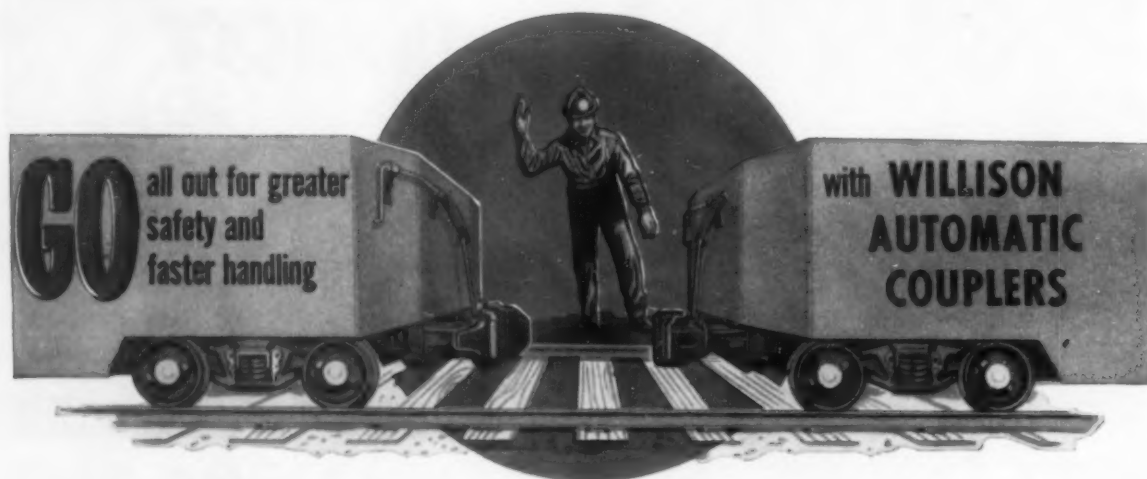
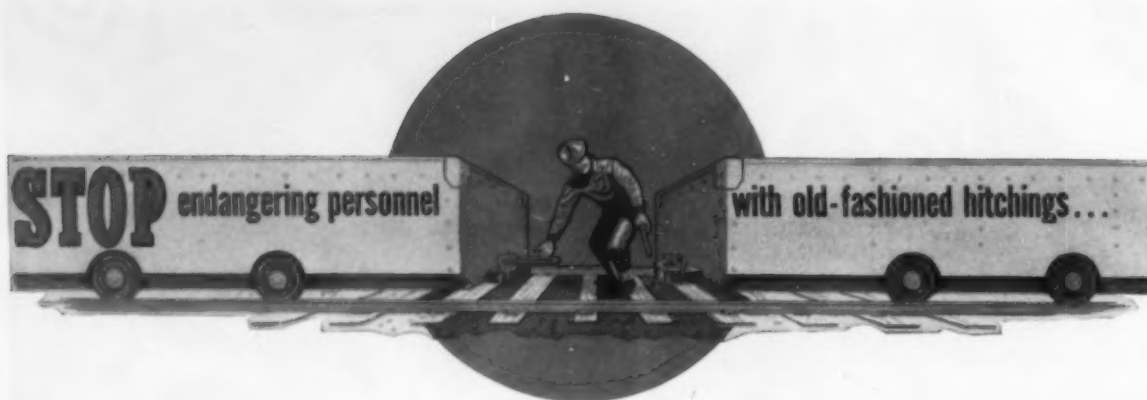
This new machine was designed by DECO engineers especially to meet the needs for leaching operations in the Uranium industry—complete suspension of solids without excessive agitation. It is another example of how DECO engineers help their customers solve special jobs!

Our Bulletin A2-B4 describes these Denver Agitators in detail.

**WHAT DELIVERY DO YOU NEED? INVESTIGATE NEW LOW PRICES!**



*"The firm that make its friends happier, healthier and wealthier"*  
**DENVER EQUIPMENT COMPANY**  
 1400 SEVENTEENTH ST. CHerry 4-4466 DENVER 17, COLORADO  
 Denver • New York • Chicago • Salt Lake City • Toronto • Vancouver • Mexico D.F. • London • Johannesburg



With Willison Automatic Couplers there's no need for personnel to go between cars to couple or uncouple. That means safety—and faster handling because Willisons uncouple from either side. All Willisons couple with each other automatically—there's no matching of coupler heads.

*For safety, faster handling and larger tonnages—Willison Automatic Couplers and National Multi-Pad Rubber Draft Gears.*

A-1001



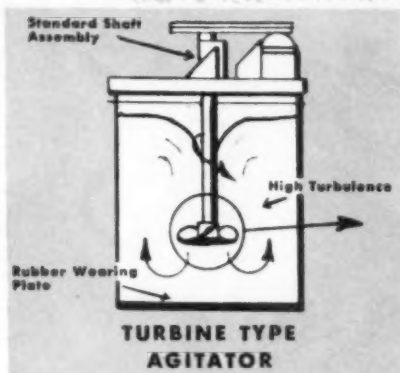
## NATIONAL MALLEABLE and STEEL CASTINGS COMPANY

Cleveland 6, Ohio

WILLISON AUTOMATIC COUPLERS • RUBBER & FRICTION DRAFT GEARS • NC-1 CAR TRUCKS  
NACO STEEL WHEELS • NACO STEEL LINKS & SWIVEL HITCHINGS



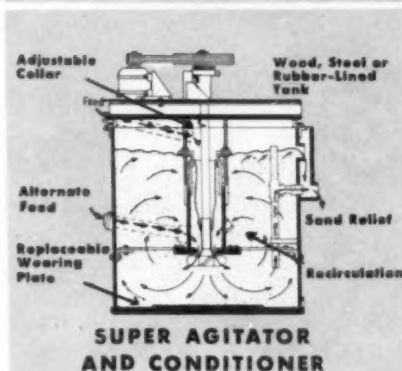
# Here are the tools to help you solve your Agitation problems and *Increase Profits!*



## DENVER Agitators for mixing and leaching

(Copper, uranium, vanadium, lithium, cobalt, zinc)

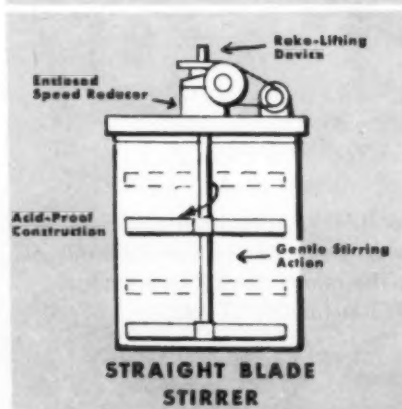
Denver Agitators and Conditioners are the only machines that are flexible enough to be adapted to meet changing ore conditions. Heavy duty construction gives you dependable service 24 hours a day!



## DENVER Agitators for flotation

(Barite, phosphate, fluorspar, iron, lead, zinc, copper feldspar)

The patented Denver standpipe gives you a flexible tool to change agitation and aeration to meet your exact requirements. These fool-proof machines will mechanically do your job—low maintenance.



## DENVER Agitators for precipitation

(Vanadium, lithium, uranium, copper)

This new machine was designed by DECO engineers especially to meet the needs for leaching operations in the Uranium industry—complete suspension of solids without excessive agitation. It is another example of how DECO engineers help their customers solve special jobs!

Our Bulletin A2-B4 describes these Denver Agitators in detail.

**WHAT DELIVERY DO YOU NEED? INVESTIGATE NEW LOW PRICES!**



*"The firm that make its friends happier, healthier and wealthier"*

**DENVER EQUIPMENT COMPANY**

1400 SEVENTEENTH ST. CHerry 4-4466 DENVER 17, COLORADO

Denver • New York • Chicago • Salt Lake City • Toronto • Vancouver • Mexico D.F. • London • Johannesburg

# NEW *TURBODIESEL*



**Cummins new NRT-6 Turbodiesel delivers 300 horsepower. One of three new Turbodiesels by Cummins. The others are 250 h.p. (model NT-6) and 600 h.p. (model VT-12).**

## **Cummins Arizona Diesel, Inc.**

Phoenix 1350 No. 22nd Ave. Alpine 8-2668

## **Cummins Intermountain Diesel Sales Company**

Salt Lake City 1030 Gale St. 22-5823

## **Cummins Diesel Sales of Colorado, Inc.**

Denver 2450 Curtis St. Acoma 2-5933

## **Watson & Meehan**

San Francisco	1960 Folsom St.	Market 1-8930
Fresno	248 Palm Ave.	4-3096
Redding	1127 Parkview Ave.	2840

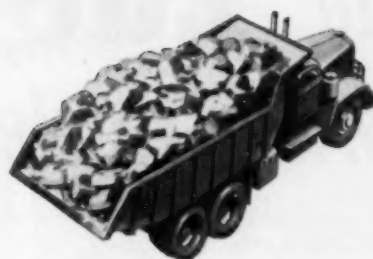
## **Cummins Diesel Sales Corporation**

Hibbing	Hwy. 169 W., Box 159	3-7558
Duluth	2319 W. First St.	Randolph 7-6851
Iron Mountain	723 River Ave.	502

*Authorized distributors for Cummins Engine Company, Inc., Columbus, Indiana*



# BY CUMMINS



## ups your production and lowers your costs!

Cummins 300 h.p. turbocharged NRT-6 pulls full loads faster, permits higher speeds on grades, cuts cycle time, because it produces greater horsepower without increase in engine size or displacement.

Turbocharging—which harnesses exhaust gases normally wasted—produces this extra horsepower by achieving a more perfect air-fuel mixture in the combustion chamber. There is no parasitic load as in supercharged engines. This means drastically reduced fuel costs . . . fewer internal stresses . . . longer engine life.

In addition, Cummins exclusive PT fuel system is simple and trouble-free . . . makes fuel system maintenance costs negligible. It is so easy to understand and work with that no specialists are needed. And all Cummins Diesels run on inexpensive No. 2 diesel fuel or furnace oil.

For further information, see the Cummins distributor in your area, or send us this coupon today.



### CUMMINS

Cummins Engine Company, Inc.  
Columbus, Indiana

Leader in rugged, lightweight,  
high-speed diesels (60-600 h.p.)

Cummins Engine Company, Inc.  
Columbus, Indiana

Please send me detailed information on Cummins  
new NRT Turbodiesel.

Name

Company

Address

City  Zone  State

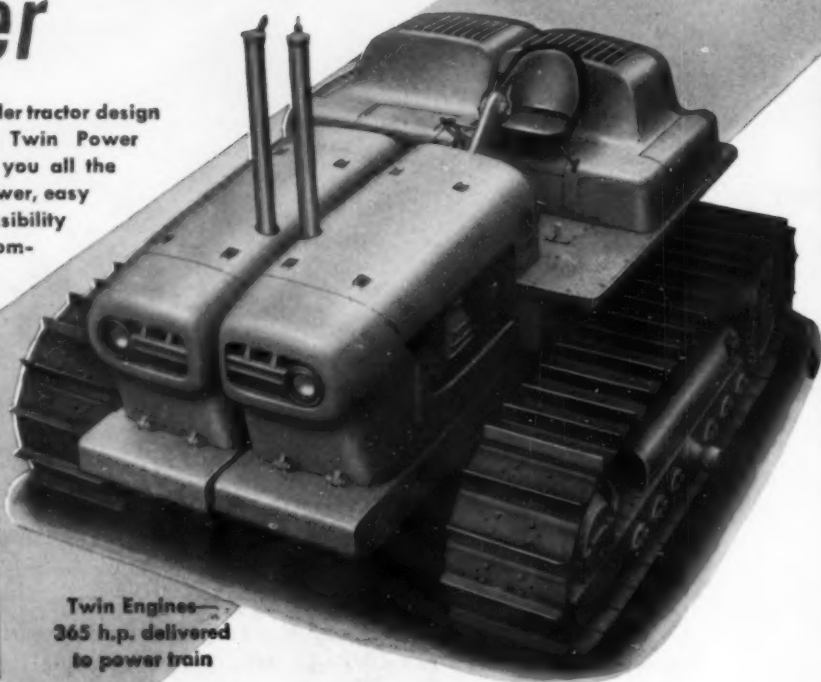
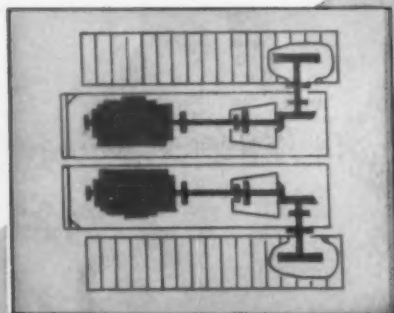
MW-7

# Biggest Tractor News in Years...

## the "Euc" **TC-12**

### Twin Crawler

Here's a completely new concept of crawler tractor design and performance... the new TC-12 Twin Power Euclid. It's designed and built to give you all the features you want in a tractor—more power, easy operation, greater workability and accessibility for servicing... and all power train components are matched, with years of application in earth moving equipment.



**Twin Engines—  
365 h.p. delivered  
to power train**

#### SPECIFICATIONS

total h.p.—398 h.p. at rated speed  
available for tractive effort—365 h.p.  
speeds—3 speed ranges forward and reverse  
to 8.3 mph

drawbar pull (bare tractor)—  
forward and reverse 54,000 lbs. low range  
53,500 lbs. intermediate  
53,000 lbs. high range

track width (standard shoe) 26"  
track gauge 110"  
overall width 11' 4"  
overall length 16' 2"  
height (excluding stacks) 7' 11"  
drawbar height 23"  
ground clearance 20"  
operating weight (bare) approx. 58,000 lbs.

Powered by two diesels with separate Torqmatic Drives for each track, the TC-12 has 365 h.p. available for tractive effort—a smooth steady flow of power to meet any job requirement. There's no master clutch and no manual gear shifting... the operator simply moves a lever to select one of three speed ranges—forward and reverse—for travel speeds up to 8.3 m.p.h. Maximum drawbar pull is equal to, or greater than, the weight of the tractor and any attachments.

Each half of the tractor is separate and free to oscillate on a single transverse shaft. This gives the TC-12 maximum stability and traction on rough ground. The tractor can be easily separated into two halves for shipment when necessary.

## Never before so much workability!

**EUCLID DIVISION GENERAL MOTORS CORPORATION, Cleveland 17, Ohio**



# Euclid Equipment

FOR MOVING EARTH, ROCK, COAL AND ORE



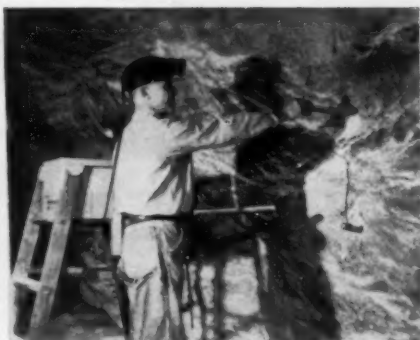
# HOW DU PONT "MS" DELAY CAPS

## increase fragmentation, reduce "bootlegs"

### at New York salt mine



**1. TYPICAL** room in the International Salt Company's mine at Retsof, New York, is undercut and drilled, ready for loading. Rooms are 10' high, 63' wide and are undercut to a 10' depth.



**2. BLASTER** loads Du Pont "Extra" F-1,  $1\frac{1}{8}$  x 16 dynamite. Du Pont "team"—"Extra" and "MS" (millisecond\*) Delay Electric Blasting Caps—are used to increase production, speed operations.



**3. PRIMER** with "MS" Delay Cap is tamped into hole. Caps have waterproof rubber-plug closures, plastic-insulated wires and aluminum-foil-shielded shunts for safer, more efficient blasting.



**4. MINER** connects "MS" Delays. Caps in each row are connected in series; rows are connected in parallel. Caps are fired with 250-volt DC power. Delay intervals used were MS-50 to MS-350.



**5. A SURVEY** of the room after shot demonstrates superior fragmentation produced by "MS" Delays. Good-sized, uniform breakage makes loading easier . . . more economical.



**6. EFFICIENCY** of the Du Pont blasting "team" shot is observable with room half cleaned up. There are no "bootlegs"—the shot has pulled all the way to the back of the undercut.

If you would like to improve fragmentation and increase efficiency in your mine, try Du Pont "MS" Delay Electric Blasting Caps. You can get more complete information from any Du Pont representative or by writing E. I. du Pont de Nemours & Co. (Inc.), Explosives Dept., Wilmington 98, Delaware.

\*"MS" Delays with copper or iron wires are available in following delay periods: MS-25, -50, -75, -100, -125, -150, -175, -200, -250, -300, -350, -400, -450, -500, -600, -700, -800, -900, -1000



## DU PONT EXPLOSIVES

Blasting Supplies and Accessories



BETTER THINGS FOR BETTER LIVING . . . THROUGH CHEMISTRY

Concentrate— $H_2SO_4$  (pH .5) Solids 30-50% (no co-

# TAGGED FOR 12 TOUGH JOBS

ation Abrasive Slag  
Rock Slime  
Filtrate  
Dorr Clone Overflow  
Sulfuric Acid  
H<sub>2</sub>SO<sub>4</sub>  
Classifier Overflow  
Feeder  
Feed for  
up (Dorr Cl  
10% H<sub>2</sub>SO<sub>4</sub>  
Repulp  
Discharge  
Tail  
Schuber  
H<sub>2</sub>PO<sub>4</sub> Cone Feed  
Lime Slurry  
Rod Mill Discharge  
Drainage  
NaCl  
Precipitation  
Classifier Overflow  
Waste Lime Mud  
H<sub>2</sub>SO<sub>4</sub> plus 10% Solids  
NaCl Flota  
Washed  
Highly Abrasive Filter Aid Pulp  
(6% H<sub>2</sub>SO<sub>4</sub> plus 2% H<sub>2</sub>PO<sub>4</sub>)  
Mn Ore Pulp  
Rougher Feed  
Fine Sand and Clay  
Overflow  
Roaster Calcine  
Thickened  
Cement Slurry  
Filter Cake  
Copper  
Slurry  
Judge  
entraining  
Plan  
Tailings Feed  
Agitator  
Dorricle  
Autoclave  
(65% Solids)  
Pickling Solution  
Uranium Leach  
Plant Sump Pump  
Phosphoric Acid H<sub>2</sub>PO<sub>4</sub>  
(Dorrclone Feed)  
HCl  
Picking Tank

## Versatile VACSEAL PUMP

### OTHER GALIGHER PRODUCTS

Agitair Flotation Machines  
Commercial and Laboratory  
Agitair  
Laboratory Ball Mills  
Geary-Jennings Sampler  
Geary Reagent Feeder  
Laboratory Pressure Filters  
Acid-Proof Sump Pumps

These Vacseal Pumps are destined for service in a variety of pumping applications. Some as difficult as pumping Iron Concentrates (65% solids) or Phosphoric Acid or highly abrasive Filter Acid Pulp. The list of users is long and varied and Vacseal's record is one of dependable on-the-job service delivering long term, trouble free performance in every type of pumping operation. Let us help you with your pumping problem. Write for catalog that gives full details on both Vertical and Standard Vacseal Pumps.

HOME OFFICE  
545 West 8th South  
Salt Lake City, Utah  
P. O. Box 209

EASTERN OFFICE  
921 Bergen Avenue  
Jersey City, New Jersey  
Agents in All Principal  
Foreign Mining Districts

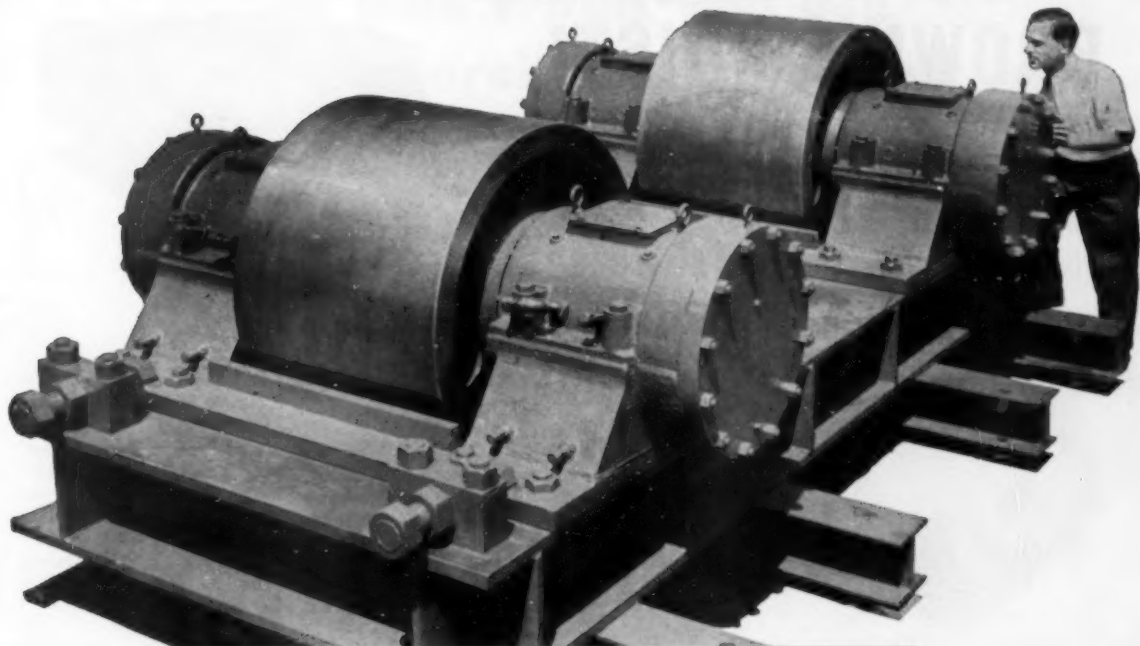
# THE GALIGHER co.

CONSULTATION • ORE TESTING  
PLANT DESIGN • GEOLOGIC INVESTIGATION





# NEED 'EM RUGGED-- Western Style?



## CALL ON **STANDARD**

Take a look at the ruggedness of the trunnion assembly pictured in the top photograph. These are trunnions for a 10 ft. diameter by 150 ft. long STANDARD kiln, just completed. Another STANDARD kiln mounted on flat cars, ready for shipment, is shown in the inset photograph. Both illustrations tell more graphically than words why STANDARD so often gets the CALL when the need is for rugged dependability. There's nothing skimpy about STANDARD Rotary Equipment. It is built to last, like the Company behind it. Now celebrating our 50th year of heavy engineering progress. WRITE TODAY FOR FULL DESCRIPTIVE LITERATURE

**Rotary  
KILNS**

**COOLERS  
CALCINERS  
DRYERS**

**ANY size  
ANYwhere**



**STANDARD**

**STANDARD STEEL CORPORATION**

5031 Boyle Avenue, Los Angeles 58

7 East 42nd St., New York 31

# YOU CAN FIND A SURE CURE for a "hoisting headache" with a BROWNIE HOIST!

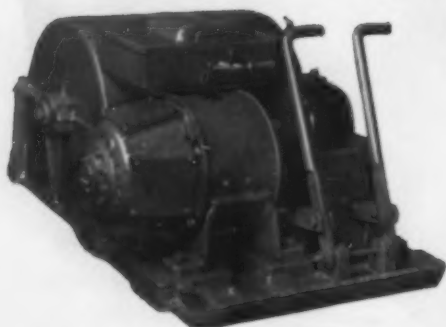
RIGGING HOISTS

HAULAGE HOISTS

ROOM HOISTS

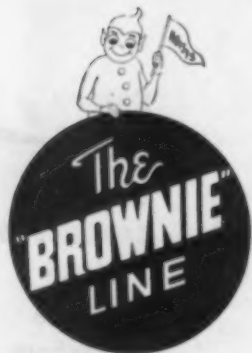
HOIST-RETARDERS

CAR SPOTTING HOISTS



IN MINING OF ALL TYPES, there's no haulage hoist problem that cannot be handled by a "BROWNIE". Hoists with a reputation of long standing for dependable service and the ability to take the punching of constant haulage. For almost 40 years we have devoted our entire engineering know-how to mining requirements. Among our various types and models available are hoists with rated capacities from 2,000 to 24,000 lbs. rope pull and with speeds from 25 to 300 feet per minute.

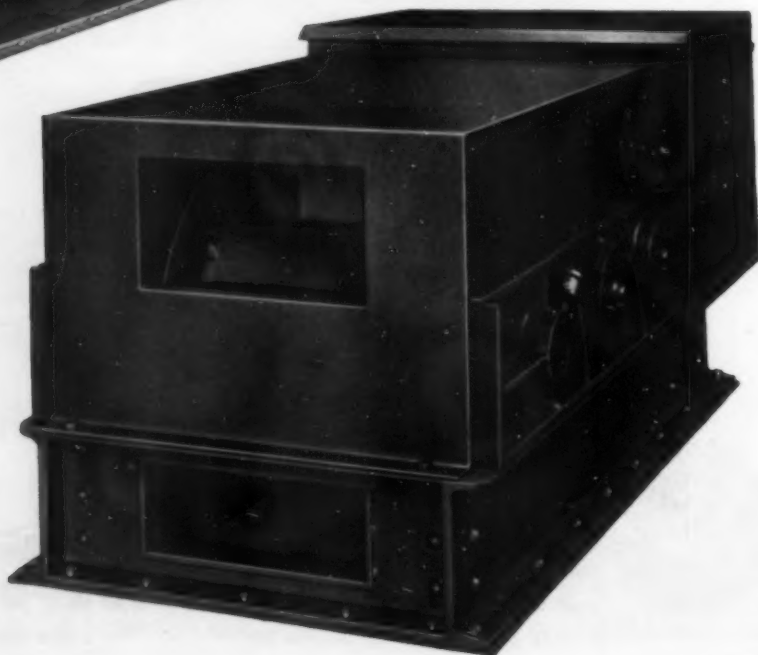
And now, remote push-button control is available to save time where practicable. Let us discuss your problems with you for greater efficiency and more effective service. Brown-Fayro Division of SANFORD-DAY IRON WORKS, P. O. Box 1511 . . . Telephone 3-4191, Knoxville, Tennessee.



Brown-Fayro Division

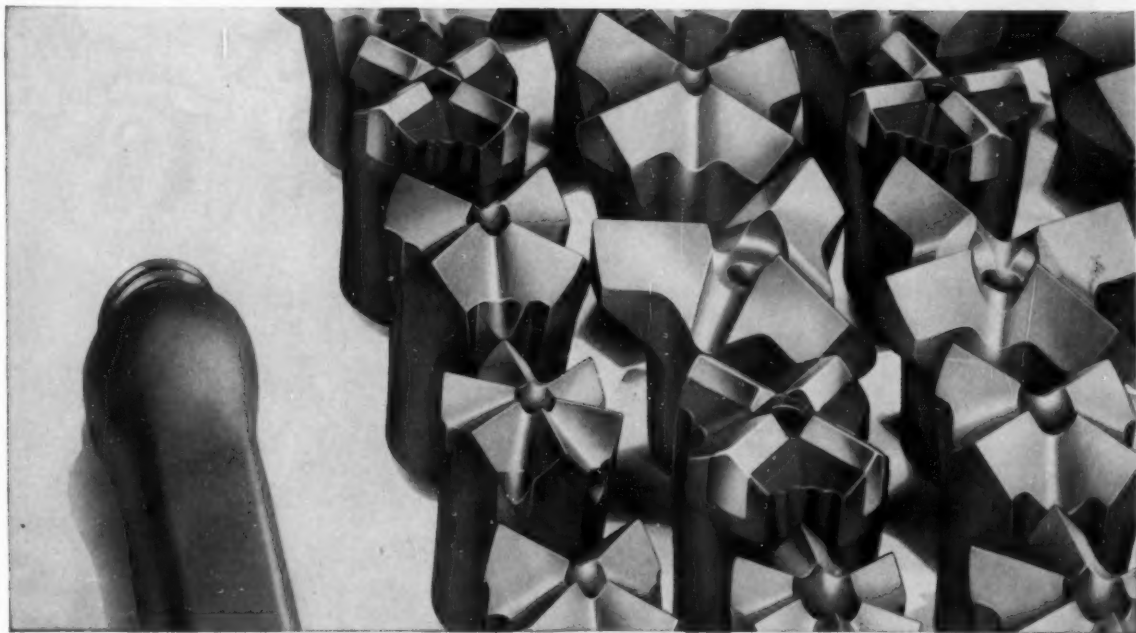
**SANFORD-DAY**  
IRON WORKS

Knoxville, Tennessee



**SAVE TIME! SAVE MATERIALS! SAVE MONEY!**

**One drill steel does dozens  
of jobs when you use  
TIMKEN® interchangeable rock bits**



*Dozens of different TIMKEN® multi-use and  
carbide insert bits fit the same drill steel*

**N**O need for your men to waste valuable time going after a different set of drill steels whenever they switch to a different type bit. In less than a minute, they can unscrew one type of Timken® rock bit and screw a different type on the same drill steel.

Timken rock bits make it easy for you to get the advantages of switch-bit drilling. They make it easy for your men to switch to the most economical bit as the ground changes—right on the job. And because dozens of different Timken multi-use and carbide insert bits fit the same drill steel, you'll be able to cut way down on your materials inventory.

Both Timken multi-use and carbide insert bits give you two distinct advantages: (1) they're made from electric furnace Timken alloy steel; (2) a special shoulder union keeps drilling impact from damaging threads.

If you want some help on drilling problems, call on our rock bit engineers. They're recognized experts in cutting costs, and their suggestions won't cost you a cent. Write: The Timken Roller Bearing Company, Rock Bit Division, Canton 6, Ohio. Cable address: "TIMROSCO".

JULY 1955



**HOW TIMKEN MULTI-USE BITS  
SAVE YOU MONEY**

Most economical for ordinary ground. With correct and controlled reconditioning, they give lowest cost per foot of hole when full increments of steel can be drilled.



**WHERE YOU CUT COSTS WITH  
TIMKEN CARBIDE INSERT BITS**

Give highest speed through hard, abrasive ground. Also most economical for constant gage holes, small diameter holes, very deep holes.

**... your best bet  
for the best bit...  
for every job**

**TIMKEN**

TRADE-MARK REG. U. S. PAT. OFF.



States where Lake Shore's "Jeto" ships have been installed.



States where Lake Shore  
more cars are used.

The "Jeto's" lightweight aluminum and steel construction, and its cleaner, faster bottom-dump action, increases payloads... boosts production. Rounded corners and simple rugged construction make the all welded "Lohed" mine car a durable, long-lasting piece of equipment... easy to maintain. Write for product bulletins giving full details and specifications.

IRON MOUNTAIN 1, MICHIGAN

**Plants:** Iron Mountain and Marquette, Michigan

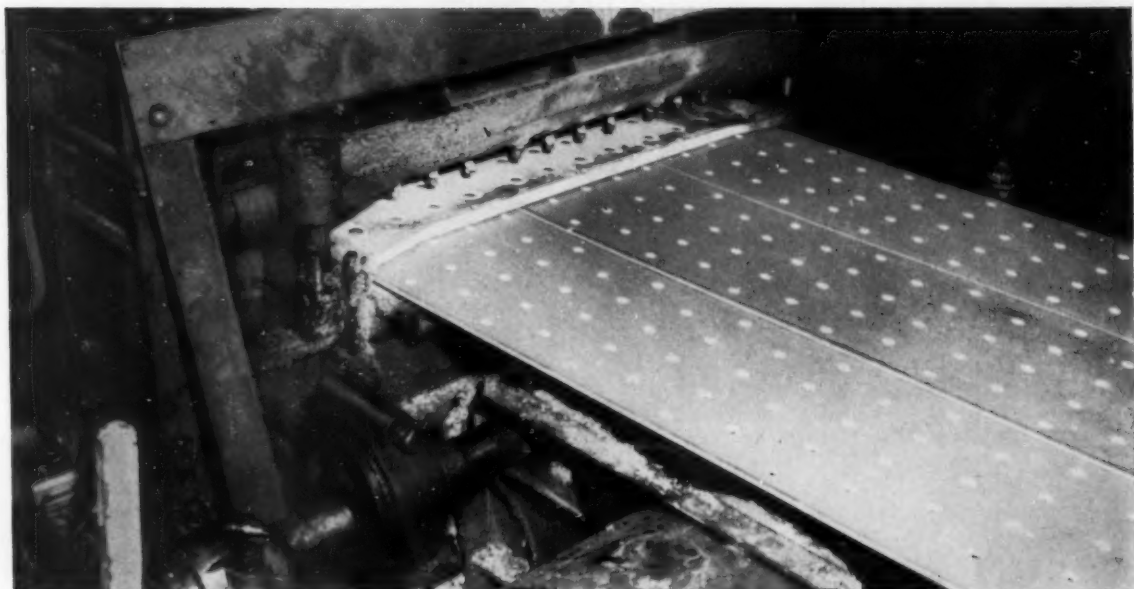


# Standard Engineer's Field Report

CASE HISTORY  
*Calol Gear Compound*  
LUBRICANT

*Blue Diamond Corp.,*  
FIRM *Blue Diamond, Nevada*

## Wet punch works 5½ years without gear loss despite extreme pressures and shock loads



BLUE DIAMOND CORPORATION, a leading Western gypsum producer, has rolled gypsum lath through this Ehram wet punch press 24 hours a day for 5½ years without a gear loss. Shock loads on this 500-pound punch exert extreme pressure on gear teeth, yet Calol Gear Compound keeps them in perfect condition. Even under these severe load conditions the lubricant protects

teeth surfaces against galling and scuffing. Calol Gear Compound is available in eight grades to meet specifications of various gear manufacturers.

**FREE CATALOG:** "How To Save Money On Equipment Operation," will be sent on request to Standard Oil Company of California, 225 Bush St., San Francisco.

**FOR MORE INFORMATION** about this or other petroleum products of any kind, or the name of your distributor, write or call any of the companies listed below.



TRADEMARK "CALOL" REG. U. S. PAT. OFF.

### Why CALOL GEAR COMPOUND protects enclosed gears

Tough film protects gear teeth against scuffing and scoring under severe shock—load conditions

Highly adhesive... clings to gear teeth and bearings, even under the wettest operating conditions



Oiliness additive reduces friction

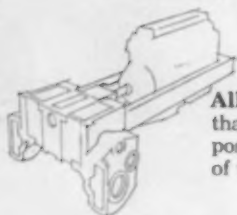
STANDARD OIL COMPANY OF CALIFORNIA  
225 Bush Street • San Francisco 20, California

THE CALIFORNIA COMPANY  
P. O. Box 780 • Denver 1, Colorado

STANDARD OIL COMPANY OF TEXAS  
P. O. Box 862 • El Paso, Texas

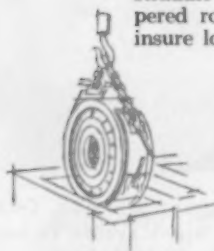
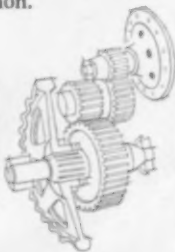
# Allis-Chalmers presents the new ANOTHER BIG STEP AHEAD IN LOW-COST DIRT MOVING

... with all the important performance advantages of  
Allis-Chalmers advanced basic design ... tested and proved  
over millions of operating hours!



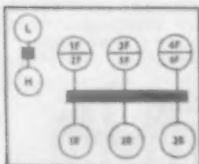
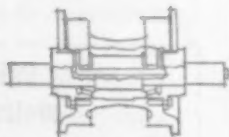
**All-Steel Box-A Main Frame** that soaks up shock loads, makes possible the service simplicity of unit construction.

**Exclusive One-Piece Steering Clutch and Final Drive Housing** with all final drive gears straddle-mounted on tapered roller bearings to insure long life.



**Unit Construction** lets you remove engine, master clutch, transmission, steering clutches and final drives without disturbing adjacent parts.

**1,000-Hour Lubrication Intervals** for roller bearing truck wheels, idlers and support rollers ... makes production time out of service time.



**Dual-Range Constant-Mesh Transmission** lets you go from any forward speed to any reverse speed by shifting only one lever. Eliminates double shifting! That means faster work cycles ... more production!

plus ... these great new features:



**New Allis-Chalmers Diesel Engine** with "follow-through" combustion and tornado turbulence ... for smooth engine performance, cleaner combustion, extra long engine life.

**New Wrap-Around Radiator Guard** used as dozer lift frame to simplify design, reduce cost of bulldozer; guard tilts forward for easy service.



**New Master Clutch with Ceramic Lining** sets new standards of clutch life ... with fewer adjustments required.

**New Operator Convenience** including roomy, flat platform ... foam rubber seat ... 24-volt direct electric starting ... 60-gal. fuel tank.



**Tough New Track** — New design, through-hardened with extra toughness for long life even in severe abrasive conditions.

**PLUS ... new, all-weather cooling; independent radiator-core mounting; new strength and capacity in final drive gears, shafts and bearings.**

**NEW STANDARDS OF PERFORMANCE AND  
LONG LIFE ON A WIDE RANGE OF JOBS**

You owe it to yourself to investigate the performance advantages of the HD-11 ... newest addition to the Allis-Chalmers leadership line. See your nearby Allis-Chalmers dealer now.

# HD-11

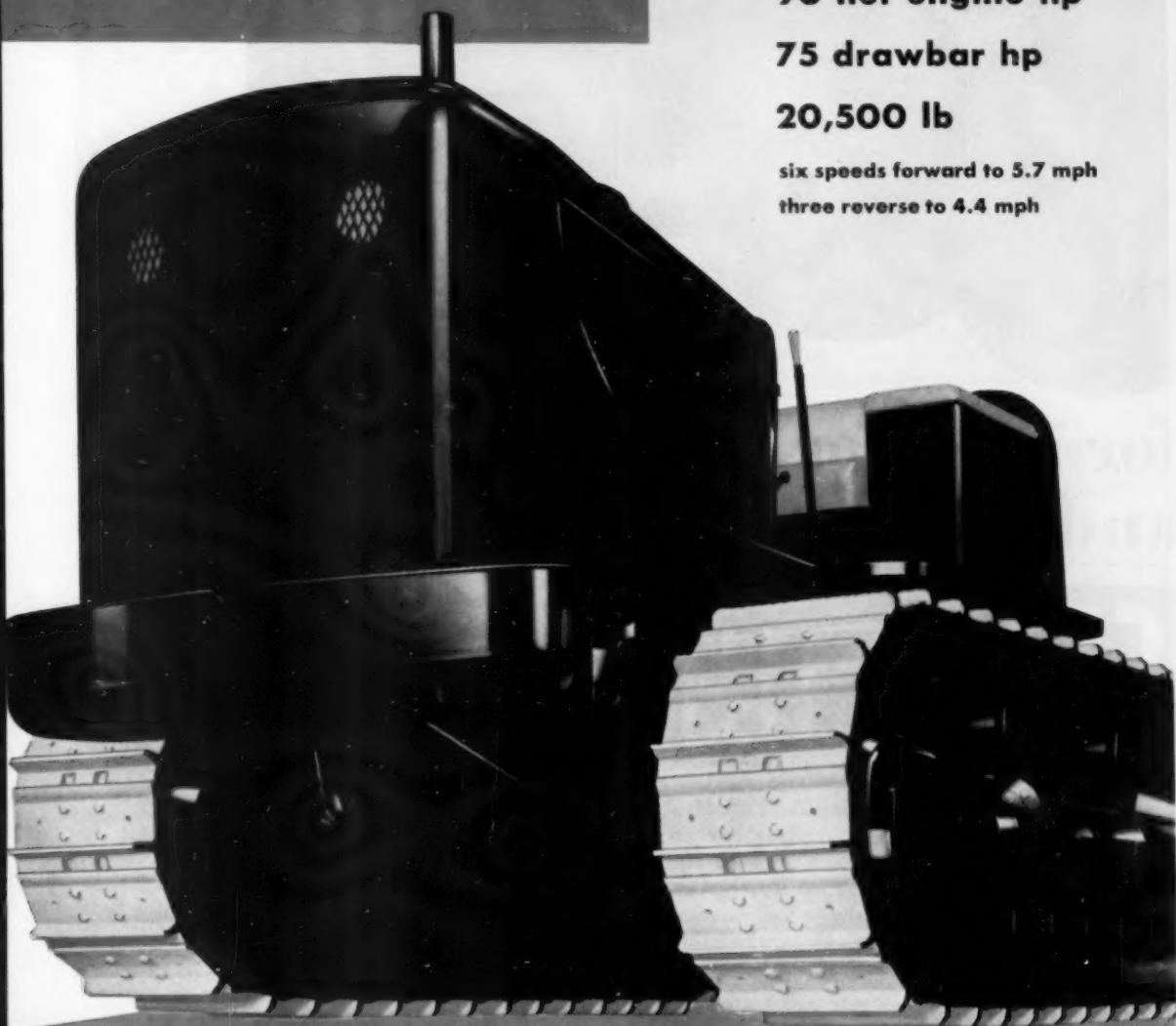
**90 net engine hp**

**75 drawbar hp**

**20,500 lb**

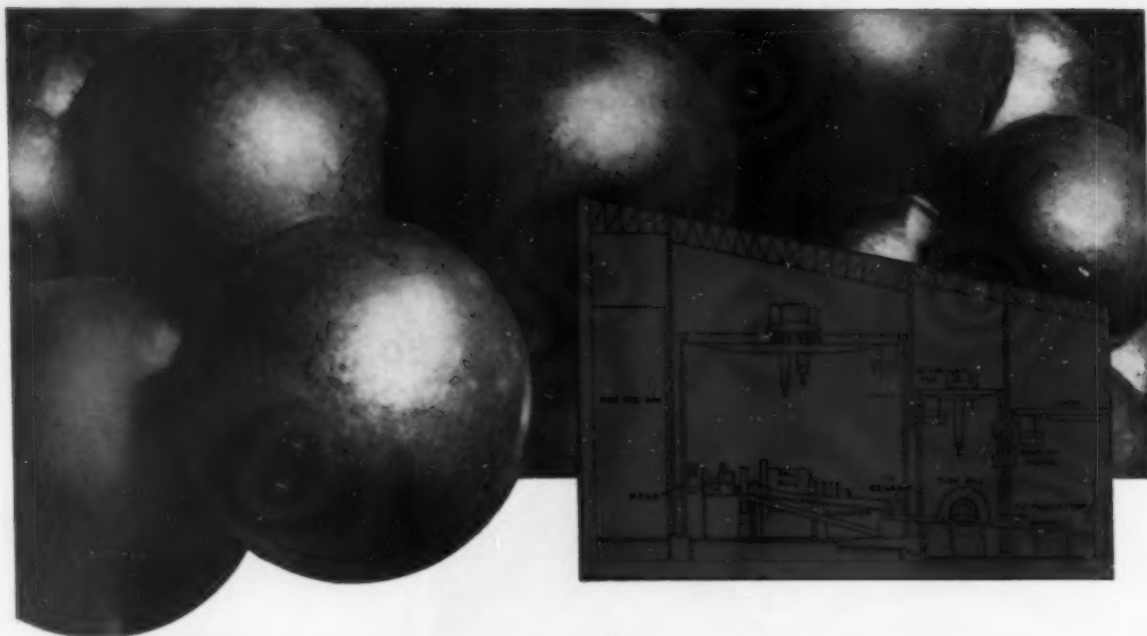
**six speeds forward to 5.7 mph**

**three reverse to 4.4 mph**



# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE 1, U.S.A.



for superior resistance to abrasion  
and impact in wet grinding...

# CF&I GRINDING BALLS

You'll find that CF&I Grinding Balls are ideal for most types of wet grinding because they combine excellent resistance to both abrasion and impact. Because of this combination of properties, they can be used economically in wet grinding mills, operating at high or low speeds, with either high or low pulp concentrations.

CF&I Grinding Balls give this superior service because they are forged from special analysis

steel. Since they are free of surface imperfections, CF&I Grinding Balls wear evenly. Further, each ball is carefully inspected throughout production and immediately before shipment to make certain that it has no surface pits, circumferential ridges or other surface unevenness.

CF&I Grinding Balls are available in diameters from 3/4" to 5". For full details, get in touch with your nearest CF&I Sales Representative.

*CF&I Steel Products  
for the Mining Industry*

Rock Bolts • Grinding Rods  
Wickwire Rope  
Mine Rails & Accessories  
Cal-Wic Industrial Screens

**CF&I FORGED STEEL GRINDING BALLS**

THE COLORADO FUEL AND IRON CORPORATION



Albuquerque • Amarillo • Atlanta • Billings • Boise • Boston • Buffalo • Butte • Casper • Chicago • Denver • Detroit  
El Paso • Ft. Worth • Houston • Lincoln (Neb.) • Los Angeles • New Orleans • New York • Oklahoma City  
Oakland • Philadelphia • Phoenix • Portland • Pueblo • Salt Lake City • San Antonio • San Francisco • Seattle • Spokane  
Wichita • **CANADIAN REPRESENTATIVES AT:** Calgary • Edmonton • Montreal • Toronto • Vancouver • Winnipeg



# Drifts and Crosscuts

## The Miner and His Problems

A little more fundamental research could go a long way toward curing some of the many problems now confronting the mining industry. In some cases foreign operators can produce at lower costs and are in a position to flood the United States with imports when demand is out of balance with supply. In other cases foreign deposits are better and higher in grade, or contain less deleterious impurities. The problem then is to find a better way of using what we have. Research must provide the answers.

This country will always be saddled with the forces of supply and demand. Where apparent overproduction exists we should, through research, develop new uses for our metals and minerals. Where production costs are high, we must develop better equipment for mining and better processing methods. Where our own deposits are unusable because of impurities, we should investigate the problem intensely, and work out a treatment that will make the deposit usable.

Some mining companies have recognized the fact that their own well being, indeed their very existence, is tied to finding basic answers to their own peculiar problem. They have established well integrated research centers which is an encouraging sign. On the other hand, the biggest discouraging factor is that no marked trend to research on the part of the mining industry has yet been evident.

Even now, a movement is underway to attempt to capture and harness the legislative forces to forward the cause of mining. In other words the industry wants to establish a solid united front in Washington. In the face of an administration whose mineral policy has been wobbly, the above proposal may serve as a rudder and permit a straight course to be charted. But the increasing dependence of the industry on government assistance will at best provide only temporary relief. The government is becoming an increasingly powerful factor in mining and the fate of chrome, mica, tungsten, manganese, lead, zinc, fluor spar (the list could be extended on and on) seem to be intricately interwoven with federal regulations. In some cases the industry has asked for support. In other cases federal regulation has been rammed down our throat.

The only solid solution, the only solution which will bring permanent relief to troubled operators, lies in their own hands. They must turn to research for the answers.

## Ore Treatment Becoming More Integrated

Developments taking place in recent years have been drawing the various methods of processing mine-run ore to its final refined product into a more

closely integrated operation. Coupled with this is a trend whereby chemical processing and treatment of ores is becoming an ordinary function of a great many mills.

The current boom in uranium has accelerated the trend towards chemical handling of ores. Mills now in operation on the Colorado Plateau are actually chemical plants. Each is using a process which differs in some respect to the one used by the next operator. No best method has yet been evolved.

Flowsheets worked out for treating tungsten ore often involve chemical production of synthetic scheelite from low grade concentrates.

Then there are the new methods of winning metals from ores and concentrates as developed by the Chemical Construction Company, subsidiary of American Cyanamid. These processes for cobalt, nickel and copper recover metals from ores and concentrates by a series of pressure leachings and precipitations followed by a reduction step. Here we have a process that starts with the ore and ends with the metal in a powder form.

The line of demarcation between ore dressing, metallurgy and chemistry, is indeed becoming fainter and fainter. The metallurgy student of today must have a thorough grounding in the fundamentals of chemistry, chemical unit processes, metallurgical unit processes, and ore dressing in order to become fully qualified to cope with the processing problems of tomorrow.

## Multiple Use of Mining Claims

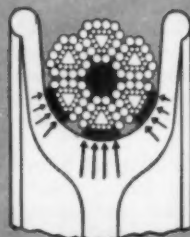
It appears that the federal legislation permitting multiple use of the surface rights on mining claims will be enacted into law with hardly a ripple of opposition. Provisions in the measures under consideration by Congress would limit the miner's use of his surface rights, and allow the government to manage and dispose of timber and other resources. In addition the claimant would be required to establish location rights at local hearings.

If the House and Senate pass the resolutions more governmental regulation will be established over an industry now increasingly controlled by the state.

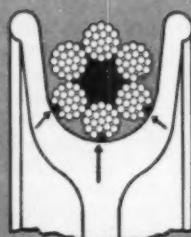
## We Hope You Like The New Cover Design

Our second editorial front cover introduces an Italian lead-zinc operator who is actively planning for the future in the face of lower grade ore reserves. The feature on page 54 describes how the company is insuring its existence in the years to come.

Future covers will be devoted to other phases of the industry. The wide coverage provided by MINING WORLD is illustrated by both this and last month's cover.



**Flattened Strand**  
four contacts per strand



**Round Strand**  
one contact per strand

## How to handle the tough jobs with Hercules Flattened Strand wire rope

When you think you need a super-rope, check Hercules Flattened Strand. This is the wire rope that packs in 10% more steel than round strand rope, making it 10% stronger and safer. It wears longer and more evenly—reduces sheave wear, too.

The 10% extra strength over round strand rope is sometimes the difference between the possible and the impossible. Hercules Flattened Strand frequently does the tough jobs which would otherwise require larger size rope—and without the bother and expense of changing sheaves and drums. The extra strength is useful, too,

when shock loading is involved. Saves rope and money.

If you think that Hercules Flattened Strand wire rope may solve a problem, talk it over first with your Leschen man. He can be reached through your nearby Leschen distributor. His advice is based on the best possible authority—Leschen's long experience and engineering research—the longest in the industry. And with Leschen wire rope you are assured of higher-than-rated quality and longer-than-expected service.

If you can use Hercules Flattened Strand rope you'll be money ahead. See about it soon.

# LESCHEN

**HERCULES Red-Strand®  
WIRE ROPE**



*Depend on Leschen's higher-than-rated  
quality for longer-than-expected service.*

**LESCHEN WIRE ROPE DIVISION  
H. K. PORTER COMPANY, INC.**

St. Louis 12, Missouri





# Capitol Concentrates

## Senate Committee Recommends that Mineral Purchase Program Continue

The Senate Committee on Interior and Insular Affairs by unanimous vote reported favorably on S. 922 to extend the government's purchase program for tungsten, manganese, chromite, mica, asbestos, beryl, and columbium-tantalum. This action, taken in the face of the actively antagonistic attitude of the Interior Department and the Office of Defense Mobilization, is a credit to the membership of that committee.

The Senate report on the bill is well worth reading. It expresses the feeling that ODM has not figured adequate margins of safety and is not sufficiently concerned with expanding the domestic mobilization base. Regarding the famous formula with which ODM fixes stockpile aims, the committee has this to say: "Some elements of the formula are arbitrary, some are matters of judgment, and all may be considered variable according to opinion. All depend on a complex number of factors. The objectives might well be greater than as now fixed."

The report also states: "The committee is thoroughly convinced that no dependence should be placed on imports during a war. Knocking out a dozen ports by means of present long-range bombing techniques would cut off nearly all imports and, further, there is some doubt how easily accessible certain of the areas so classified would be."

Senator Goldwater told the Subcommittee on Minerals, Materials and Fuels of the Senate Interior Committee, "These programs either will have to be extended by law or, unless we have war pressures sufficient to scare the Office of Defense Mobilization, they will be terminated as soon as the present law and the regulations will allow ODM to do so. It is most unlikely that stockpile aims, especially long-term, do not have room for the amounts of domestic minerals which would be produced under these programs. Budget and ODM would rather pay less. Even the manganese program appears to have that much room in it."

The rest of Senator Goldwater's statement makes fascinating reading, but is too long to quote in full here.

The Senate committee recommended that all present purchase depots, "including that at Wenden, Arizona, be continued in operation until the expiration of the extension contemplated by S. 922 and, in addition, strongly recommends the establishment of additional manganese-purchase depots in appropriate places within the Ozark-Cushman and Southern Appalachian areas. . . ."

It is most interesting to note that S. 922 is a completely bi-partisan bill, having been sponsored by such important Democrats and Republicans as: Senators Goldwater, Hayden, Murray, Malone, Martin of Iowa, Mansfield, Scott and Bible.

Whereas a bill covering one mineral might have a tough time in Congress and most certainly would be

vetoed, S. 922 covers such a variety of minerals in so many states that it should have not only broad political support but is much less likely to be vetoed. There is the precedent of the Aspinall-Malone Act, covering the same minerals, which was passed against agency opposition and which the President signed into law.

### • Columbium-Tantalum Procurement Ended

One of the most peculiar moves on the part of the Office of Defense Mobilization which has occurred in a long time—and ODM is noted for peculiar moves—is the cancellation of the columbium-tantalum procurement program. The procurement goal was set originally for 15 million pounds and an agency spokesman now announces that "receipts plus forward commitments to buy ores have reached the 15 million pounds GSA is authorized to buy." Unofficial estimates indicate that the program is still almost 5 million pounds short in actual deliveries.

Only a few years ago the armed services were desperate for this alloying material and, it was rumored, figured that there was so little likelihood of getting enough that around \$25 million was spent designing substitute alloys into engines. It looks as though they had succeeded, but at the same time you never can tell if and when the columbium-tantalum alloys may be in vogue again.

The flexibility of the stockpile formula, pointed out by the Senate Interior and Insular Affairs Committee, once more is illustrated.

### • Copper Diversion Again Authorized

The Office of Defense Mobilization has authorized the diversion of about 16,000 tons of copper to private industry during the third quarter of 1955. The metal will come from stocks earmarked for delivery to the government during the third quarter.

ODM Director Flemming emphasized that none of the copper is to be withdrawn from supplies already in the national stockpile. Similar releases were authorized during the first and second quarters of the current year and in the fourth quarter of 1954.

### • Lead-Zinc Purchase Proposal

Legislation which would direct the government to purchase at least 200,000 tons of lead and 300,000 tons of zinc from domestic mines for the national stockpile has been introduced by Senator Goldwater of Arizona.

The Goldwater bill declares that "an economically healthy lead-zinc industry is essential to the security of the United States" and therefore directs the Office of Defense Mobilization to buy the domestic production at specified prices. The guaranteed price would be not less than 16 cents a pound for lead and 15.5 cents a pound for zinc. Purchases would be made at the rate of 10,000 tons of lead and 15,000 tons of zinc per month.



## COLUMBIAN ALL-METAL BUILDINGS

### Strong • Fire Safe • Low Upkeep

Columbian All-Metal Buildings are increasingly popular with the mining industry because of their unlimited utility value—for warehouses, engine houses, dryhouses, shops, garages, compressor houses, etc. Prefabricated from quality steel. Sectional construction assures easy, low-cost erection. Exceptionally weather-tight. Rigid, strong, fire-safe. Minimum upkeep. Order from distributors listed below—or write direct for complete information.

#### COLUMBIAN STEEL TANK CO.

P. O. Box 4048-H, Kansas City, Mo.

##### Distributors in the United States

Denver Equipment Company  
1400 Seventeenth Street  
Denver, Colorado

Einco Corporation  
34 South 4th West Street  
Salt Lake City, Utah

##### Distributors—Foreign

Avenida Ejercito Nacional 458-D  
Colonia Chapultepec Morales  
Mexico, D. F.

## FEEDOWEIGHT

A self-contained conveyor feeder scale that feeds, weighs and totalizes. Use the Feedoweight for better control of ball mill grinding. It accurately controls



FEED by WEIGHT, automatically. Made in sizes to meet all tonnage requirements.

## MERRICK SCALE MFG. CO.

PASSAIC

172 Summer Street

NEW JERSEY

## CHANGE OF ADDRESS

### CIRCULATION DEPARTMENT

MINING WORLD with which is combined the Mining Journal  
121 Second St., San Francisco 5, Calif.

Please change the address of my Mining World subscription

NAME .....  
OLD ADDRESS .....  
NEW TITLE OF POSITION .....  
NEW ADDRESS .....  
NEW COMPANY CONNECTION .....

The proposed purchase price is described as a compromise based upon previous testimony before the Simpson Committee by Otto Herres and others that the domestic mining industry would have to have a combined minimum price of 30 to 32 cents a pound in order to maintain production. Hearings on the bill are planned, but the date has not been announced.

### • Uranium Stock Issues Studied by SEC

The Securities and Exchange Commission is carefully examining its rules and regulations governing unregistered stock issues, particularly those for uranium enterprises. Stock issues of \$300,000 or less are exempt from SEC registration and full disclosure requirements.

Activities of some uranium stock promoters, both in the United States and Canada, are giving the industry a black eye, according to the commission. In some cases, it was said, uranium common stocks sold to the public have inferior positions in the corporate structure to options and warrants given the promoters, and thus if the venture is successful, the promoters will profit at the expense of the public stockholders. In other cases, promoters of an unregistered stock issue get enough money from the sale of stock to pay expenses and give themselves a profit—with little or nothing left over for digging uranium-bearing ore.

As a result, the commission may change its regulations to require more information from the exempt issues, such as terms of the offering, the relation of the promoters to the company and the stock they receive, more facts about the company, a description of properties and terms of leases, and information on royalties to property owners. Also under consideration is a requirement that money obtained from promotional stock sales be placed in escrow until the entire issue is sold.

### • Small Aluminum Fabricators Are By-Passed

The squeeze on the independent aluminum fabricators has been pointed out by Senator James E. Murray, chairman of the Senate Interior and Insular Affairs Committee. Senator Murray claims that small fabricators are not getting a fair share of the aluminum produced in government-financed facilities, and demands that the Office of Defense Mobilization, through the Department of Justice, bring antitrust suits and force the "big three" to divest themselves of fabricating facilities.

## COMING CONVENTIONS

- August 8 to 28. INTERNATIONAL CONFERENCE OF THE PEACEFUL USES OF ATOMIC ENERGY, sponsored by the United Nations. Geneva, Switzerland.
- September 8 and 9, 1955. IDAHO MINING ASSOCIATION. Sun Valley, Idaho.
- October 21, 1955. Second Alumni Reunion. MINNESOTA SCHOOL MINES AND METALLURGY, Minneapolis, Minnesota.
- October 3 through 6, 1955. Twenty-fifth annual meeting SOCIETY OF EXPLORATION GEOPHYSICISTS, Shirley Savoy Hotel, Denver, Colorado.
- October 5 through 8, 1955. Rocky Mountain Minerals Conference, AMERICAN INSTITUTE OF MINING AND METALLURGICAL ENGINEERS. Fall meeting of Minerals Beneficiation Division. Salt Lake City, Utah.
- October 10 through 13. Annual meeting AMERICAN MINING CONGRESS, Las Vegas, Nevada.
- November 8 through 11, 1955. Annual Meeting AMERICAN COUNCIL OF INDEPENDENT LABORATORIES, INC. Westward Ho Hotel, Phoenix, Arizona.
- December 10 through 16. NUCLEAR CONGRESS and ATOMIC EXPOSITION, Public Auditorium, Cleveland, Ohio.



# DIAMOND DRILL BITS

## POWDERED METAL

Special tungsten alloy powdered metal matrix to meet all drilling conditions. Bit crowns sintered onto blank bits in one operation.



*Diamonds for mineral boring... for prospecting.*

Drill borts and cast in all sizes and prices. Brazilian ballas and carbons.

Choose the RIGHT matrix hardness for YOUR job!

ASCOLITE bits... 55 to 60\* hardness  
NICOLITE bits... 40 to 45\* hardness  
BRONZOLITE bits 18 to 24\* hardness  
\*On Rockwell "C" scale

ASCOLITE reaming shells

Price catalog on request

ESTD 1908 **ANTON SMIT & CO., Inc.**

333 W. 52nd St., New York 19, N. Y. • Cables: PROFITABLE, New York

# Over Half Century Experience in

Exploration and Development

Diamond Core Drilling

Grouting

Rock Breaking

Mining—Quarrying and Tunnel Driving

Full details on request

**Boyles Bros.**  
DRILLING COMPANY

1321 SOUTH MAIN STREET • DIAL 84-4801 • SALT LAKE CITY, UTAH

BRANCH OFFICES

Colville, Washington  
Telephone 181

Leadville, Colorado  
Telephone 526

Phoenix, Arizona  
Telephone Crestwood 4-5351



1940-1955  
OUR 15th YEAR  
OF PROGRESS ... 15 YEARS OF

CONTINUED IMPROVEMENT  
OF ALL OUR SERVICES...



and now...  
**ARGON**  
99.99% pure!

Manufacturers  
of

OXYGEN  
ACETYLENE  
HELIUM  
MEDICAL  
GASES  
NITROGEN  
and

99.99%  
PURE ARGON

**INDUSTRIAL  
AIR PRODUCTS CO.**

PORTLAND • SPOKANE • SEATTLE  
YAKIMA • MEDFORD • KENNEWICK

# YOU CAN SELECT THE BEST

There's a Coast Safety Fuse designed for every blasting operation:

TRIPLE TAPE... for very wet work, rough handling

BEAR... for wet work; is white countered

SEQUOIA BLACK... for warm climate, heavy water pressure

SEQUOIA WHITE... hot climate, inflammable explosives, heavy water pressure

DREADNAUGHT... wet work, cool climate

BLUE LABEL... dry or damp agricultural and quarry work

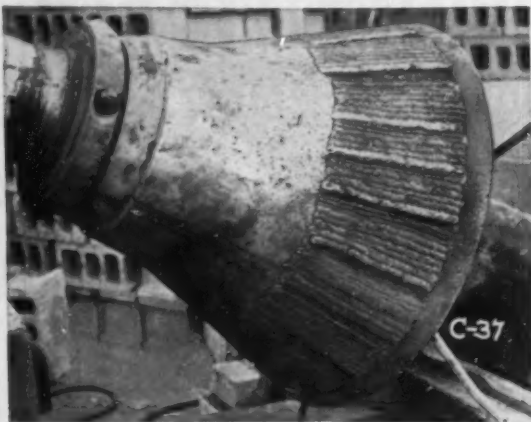
REMEMBER COAST'S SPITTERCORD



PRIMACORD - BICKFORD  
Hot Wire Fuse Lighters  
Detonating Fuse  
Safety Fuse  
Celskap

Ask your powder supplier or write for literature

**COAST MANUFACTURING & SUPPLY CO.**  
LIVERMORE CALIFORNIA



### Before and After Applying MANGA-TONE N.M. and RESISTO-LOY

This rebuilding job on Gyratory Liners was accomplished economically despite the fact that well over an inch of deposited metal was required all around the bottom third. Note the very badly worn areas in the "before" picture. Then note the perfectly done, finished job.

This rebuilding was done by the plant maintenance welder, using our Manga-tone N.M. to rebuild the liner and making the last pass over the lower 15 inches with Resisto-Loy. This final coating pays a fine dividend in additional wear resistance.

Why not put in a call for our field man? He can show you many ways to save materials and money.

**RESISTO-LOY CO., INC. - Grand Rapids 7, Michigan**

## An Unfailing Market for:



**GOLD • SILVER • COPPER  
LEAD • ZINC**

**Ores • Concentrates • Bullion  
Precipitates • Furnace Products**

FOR SCHEDULES, FREIGHT RATES, ETC., WRITE TO YOUR NEAREST OFFICE



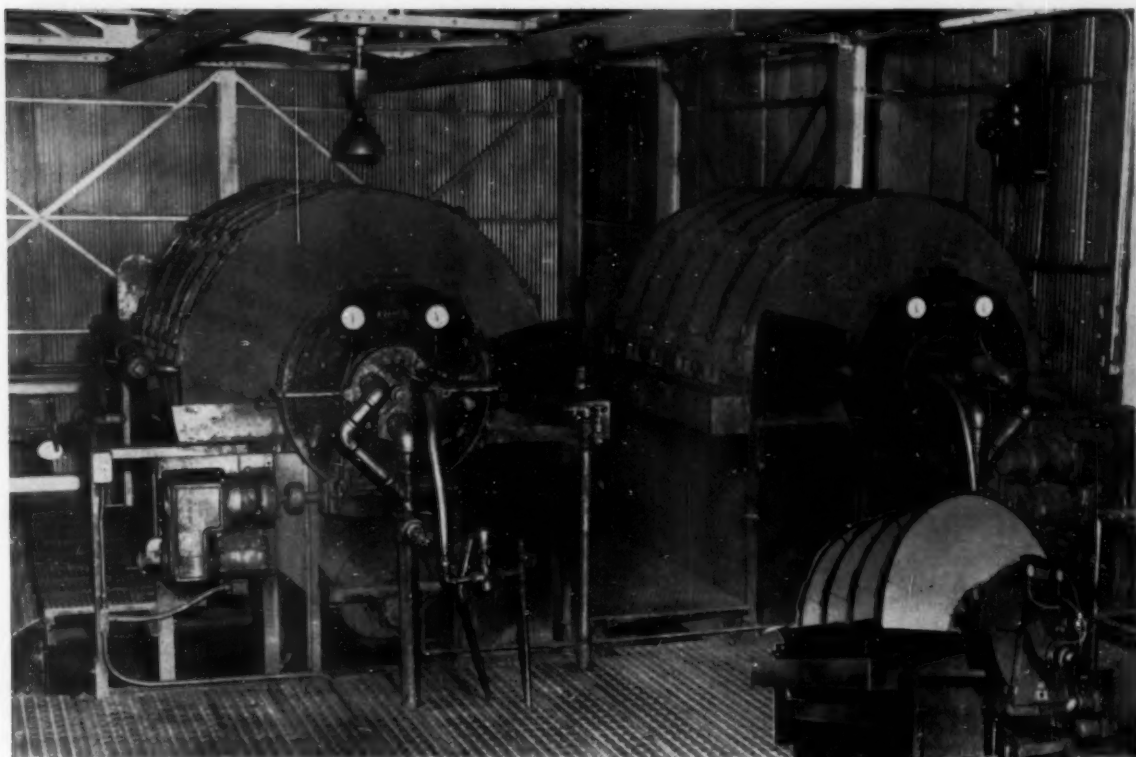
# AMERICAN SMELTING AND REFINING Co.

Tacoma 1, Wash.

405 Montgomery Street  
San Francisco 4, Calif.  
607 First National Bank Bldg.  
Denver 2, Colorado

700 Pacific Nat'l. Life Bldg.  
Salt Lake City, Utah  
810 Valley Bank Building  
Tucson, Arizona

P. O. Box 1111  
El Paso, Texas  
East Helena, Montana



## New Metallurgical Installation Saves Space and Improves Product with Eimco Agidisc Filters

Eimco Agidisc Filter

The photo above shows an installation of two 6' diameter by 5 disc Eimco Agidisc Filters in their operating position in a new metallurgical concentrating plant.

These filters were installed as a result of the owner company and Eimco cooperation in a joint effort to

improve the operation of the filter station at this plant and reduce moistures with the most economical equipment.

After the installation had been operating for six months the following data was made available.

	PREVIOUS EQUIPMENT	NEW EIMCO FILTERS
1. Concentrate handled	350,000 lbs./24 hrs.	350,000 lbs./24 hrs.
2. Labor required	1 man full time	1 man part time
3. Attention required	Constant inspection	Periodical inspection every 6-8 hrs.
4. Operating Capacity	Full load—no capacity for additional tonnage	1/2-3/4 load—capacity for 33% to 100% additional tonnage
5. Equipment	4—Drum filters (not Eimco)	2—6' dia. x 5 disc Eimco Agidiscs
6. Filter area	621 sq. ft.	500 sq. ft.
7. Floor Space occupied	416 sq. ft. filters only	189 sq. ft. filters only
8. Cake Moisture	20%—21%	14%—15%
9. % Moisture reduction over previous method		33%
10. Filter rate increase over previous method		more than 15%

Eimco specializes in equipment to do a better job in filtration. Before you buy, take advantage of Eimco's experience in building filtration equipment

for customers who look beyond first cost to get quality construction, individual design and guaranteed performance.



## THE EIMCO CORPORATION

Salt Lake City, Utah—U.S.A.

Export Offices: Eimco Bldg., 52 South St., New York City

New York, N.Y. Chicago, Ill. San Francisco, Calif. El Paso, Texas Birmingham, Ala. Duluth, Minn. Kellogg, Ida. Baltimore, Md. Pittsburgh, Pa. Pasadena, Calif. Houston, Texas London, England Gateshead, England Paris, France Milan, Italy Johannesburg, South Africa

B-102

PAN

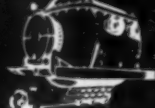
CONTINUOUS PRESSURE

PRESSURE PRECOAT

BI-CARB

PRESSURE ROLL

BURWELL



# Mining World

THE IMPORTANT MINING MAGAZINE EVERYWHERE

## —INTERNATIONAL PANORAMA—

WASHINGTON, D. C.—The General Services Administration has signed contracts with two firms—National Research Corporation and Horizons, Inc.—to seek more efficient methods of producing titanium.

BATTLE MOUNTAIN, NEVADA—Magnet Cove Barium Corporation plans to build a 175-ton-per-day barite mill near Battle Mountain which will handle ore from the Graystone mine.

BONN, WEST GERMANY—The Krupp firm has concluded an agreement with the Pakistan Industrial Development Corporation to build a steel plant with an eventual annual capacity of 350,000 tons of crude steel.

SEOUL, KOREA—Indications of uranium in Kangwon and South Choonchong provinces has led to increased exploration in these areas.

VANCOUVER, BRITISH COLUMBIA—Texada Mines Ltd. is negotiating contracts for shipments of iron ore to Japan and to West Germany.

COLERAINE, MINNESOTA—The M. A. Hanna Company will open a new iron ore mine to be known as Parcel 3, near Coleraine. A washing, heavy media, and cyclone plant will be constructed.

NEW YORK, NEW YORK—Freeport Sulphur Company will mine an underwater sulphur deposit in the Louisiana tidelands, 60 miles southwest of New Orleans.

TOKYO, JAPAN—Takahashi and Company is reported to have hired a United States engineer to prospect for uranium in Japan.

WENDEN, ARIZONA—The General Services Administration has closed its manganese ore purchasing depot after buying the allotted 6,000,000 long ton units.

SAARBRUECKEN, SAAR TERRITORY—A modernization program is planned for the French iron ore mines to increase their output to 50,000,000 tons by 1957. The program will cost about \$100,000,000.

STOCKHOLM, SWEDEN—A bill now under discussion in the Swedish parliament would make the iron mines in Lapland wholly government owned. The government presently owns 50 percent, and the mines produce 75 percent of Sweden's iron ore output.

NEW DELHI, INDIA—Iron ore reserves are estimated at 21,000,000 tons, nearly one quarter of the world's reserves, according to a United Nations survey.

CALUMET, MICHIGAN—Calumet & Hecla, Inc. management has been authorized to terminate all or any part of the copper mining operations in Calumet, Michigan where a strike has closed down operations. The company is currently suing the union for damages.

KUALA LUMPUR, MALAYA—The Malayan Miners Company Ltd. has made its first shipments of iron ore to Japan, and expects to be sending 40,000 tons a month shortly.

STEEP ROCK, ONTARIO—Caland Ore Company, subsidiary of Inland Steel Company, has started dredging operations at Steep Rock Lake. This is said to be the largest dredging operation ever undertaken.

WASHINGTON, D. C.—Fifty-nine applications for exploration assistance in uranium projects were received by the DMEA during the first three months of 1955, a 50 percent increase over the number received in the last quarter of 1954.

SALT LAKE CITY, UTAH—Seven Colorado Plateau firms are considering a merger which would result in formation of Midwest Consolidated Uranium Corporation.

GRAND JUNCTION, COLORADO—The Colorado Mining Association has opened a branch office in Grand Junction to serve the needs of the miners in the Four Corners area.

WASHINGTON, D. C.—The office of Defense Mobilization has revealed that the government now has on hand metals and minerals valued at \$800,000,000 in its long-term stockpiling program. Total goal was set at \$3,100,000,000. By June 3, 1956, it is expected that 62 minimum objectives of the 76 materials now being stockpiled will be 75 percent or more completed.

### Bear Creek Negotiating For Jenny Lind Unit Work

Bear Creek Mining Company, exploration division of Kennecott Copper Corporation is negotiating with E. J. Longyear & Company to take over operations on the 3,000-acre Jenny Lind unit in Utah's Tintic District.

Upon completion of contracts, Bear Creek plans to engage in geophysical survey and geological diamond core drilling on the holdings.

The Jenny Lind is a geological prospect for nonferrous metals held by a group of mining companies in the district. Under the system claims are pooled, so that if ore is found on the claims of one participating company, other parties in the unit share in the discovery. Participating in the Jenny Lind Unit in addition to Longyear are Chief Consolidated Mining Company, Newmont Mining Company, United States Smelting Refining and Mining Company, and the Raddatz estate of Salt Lake City, Utah. On the basis of land contributions, Chief Consolidated holds 50 percent interest in the project.

### Governors To Plan Western Mining Policies

A Western Governors Mineral Policies Conference will be held in Sacramento, California November 7 and 8. It will be the first of its kind ever undertaken, and has been called for the purpose of determining what policies are necessary to the welfare of the mining and mineral consuming industries in the eleven western states. Conference recommendations will then be submitted to the Congress and the Administration for their consideration.

The initial meetings of the Conference Planning Committee were held in San Francisco and Los Angeles in May. DeWitt Nelson, director of the California Department of Natural Resources, was chairman of this group. Close to 100 representatives of all phases of the western mining industry gathered at the San Francisco meeting to discuss how the mechanics and program of the conference should be handled. Among those serving on this committee is George O. Argall, Jr., editor of MINING WORLD.

### AMC Program Committee Plans for October Meeting

The Program Committee for the American Mining Congress meeting to be held in Las Vegas, Nevada October 10-13 met during June to map a program for the three-day Metal Mining and Industrial Minerals Convention.

L. J. Randall, president, Hecla Mining Company, Wallace, Idaho is national program committee chairman for the AMC.





MINING WORLD EDITOR INTERVIEWS PHILIPPINE PRESIDENT at Manila. Just before departing for Japan, George O. Argall discussed some of the problems facing Philippine mine operators with President Ramon Magsaysay. Shown above

from left to right are George Scholey, consulting engineer for A Soriano y Cia, Mr. Argall shaking hands with President Magsaysay, and Benjamin Gozon, director of the Philippine Bureau of Mines, in the background.

## Philippine President Discusses Mineral Policy with Mining Editor

One of the highlights of MINING WORLD Editor George O. Argall's trip to the Republic of the Philippines was the opportunity to discuss the mining situation with President Ramon Magsaysay. The interview climaxed a 3½-week survey of mining and metallurgical operations in the Pacific Island Republic. Mr. Argall and the President talked freely of industry problems confronting the Philippines.

President Magsaysay expressed the keen desire of his country to attract more venture capital to finance undeveloped mineral deposits in the islands. MINING WORLD's editor pointed out that a large share of the responsibility rests with the Philippine government; it must establish an equitable climate and incentive for possible investors.

Mr. Argall also discussed with the President another problem now facing

mine operators—that of facilitating purchase of spare parts for mine equipment installations in the islands. All imports from dollar areas must be licensed by the Philippine bank. Mining companies in general have been getting what they ask for, but the need for expediting dollar allocations, by cutting red tape, for parts purchases abroad was apparent.

According to Mr. Argall, the United States Foreign Operations Administration has equipped the University of the Philippines with a marvelous set of ore dressing machinery. The Philippine student engineer has a wonderful opportunity to learn by operating this equipment. American advisors to the university must follow through and insist that practical training rather than theory be followed in order to adequately train Philippine engineers in the use of the equipment.

Touching on exploration, MINING WORLD's editor said that discovery of mineral deposits in the Philippines is hampered by the shortage of outcrops, and rock or soil slides. In the tropical climate, weathered soils quickly mask the rock. The heavy jungle, particularly in the lowlands, is another deterrent. This means that a lot of mapping has had to be done in river beds where bedrock is exposed. It appears quite likely that geochemical prospecting will gain in importance. Surprisingly, investigations have disclosed that there is a minimum of trace element migration in the tropical soil, and that where traces are found that primary sources may not be too far away.

Mr. Argall left the Philippines May 10, and completed his tour of the Orient with visits to Japan, Korea, and Hong Kong.



NEWEST PLANT in the uranium belt is Kerr-McGee's operation at Shiprock, New Mexico. This bird's eye view shows crude ore stockpile, the sampling plant at the end of the ramp in

the lower left quadrant and the tailing area. The main building houses the treatment facilities which are one part applied chemistry and one part mystery for security reasons.

## Acid Cure: A New Process for $U_3O_8$

*Developed by combined efforts of private enterprise and the AEC, this Process has been put to work at Kerr-McGee's new plant at Shiprock*

The Colorado Plateau's ninth and newest uranium ore processing plant was placed in operation at Shiprock, New Mexico on November 1, 1954 by the Navajo Uranium Division of Kerr-McGee Oil Industries, Inc. The \$3,000,000 mill incorporates the latest available design features and metallurgical methods of a young growing industry for the extraction of uranium from a wide variety of ores.

Everything about this operation is new. Kerr-McGee, the owner and operator, is new to mining and metallurgy. The acid cure process being used has never before been employed by any other uranium mill. The company has taken bold, forward steps to adopt measures for combatting corrosion problems attendant to handling acid pulps. The success of the operation is a tribute to the competent

hard working staff of the Kerr-McGee organization.

### **Acquisition of Mines**

Kerr-McGee, recognizing the potentialities of the uranium field, entered the picture in 1952 when they acquired the properties and assets of the Navajo Uranium Company. These deposits are in the northeastern corner of Arizona, and most of the production from company mines is carnotite-roscoelite ore from the Salt Wash member of the Morrison Formation.

The metallurgy for ores of the region, including anticipated custom ores, was worked out by consolidating the research efforts of the Bureau of Mines station in Salt Lake City, the AEC laboratory at Watertown, Massachusetts, operated by American Cyanamid Company, and by Kerr-

McGee's research staff at Oklahoma City.

Actual construction of facilities on land leased from the Navajo Indian Tribal Council was begun in February 1954 by Western-Knapp Engineering Company. Kerr-McGee erected 20 modern housing units at Shiprock to accommodate employees.

### **Why Acid Curing Selected**

The ore produced at the Kerr-McGee properties is readily amenable to an ordinary acid leach. High lime ores, on the other hand, require special treatment, such as the carbonate leach employed at Anaconda's Blue-water plant (See MINING WORLD, August 1954, pages 34 through 39) or an acid cure such as that employed at the Shiprock plant. The obvious reason is that reagent consumption

would be excessive in treating high lime ores with a dilute acid leach. In addition, uranium in a reduced form associated with carbonaceous material doesn't respond readily to a dilute acid leach. The acid cure makes it possible to treat ores with intermediate lime content (6 to 8 percent  $\text{CaCO}_3$ ), and, by proper blending and scheduling, to handle a certain amount of high lime ore (over 18 percent  $\text{CaCO}_3$ ).

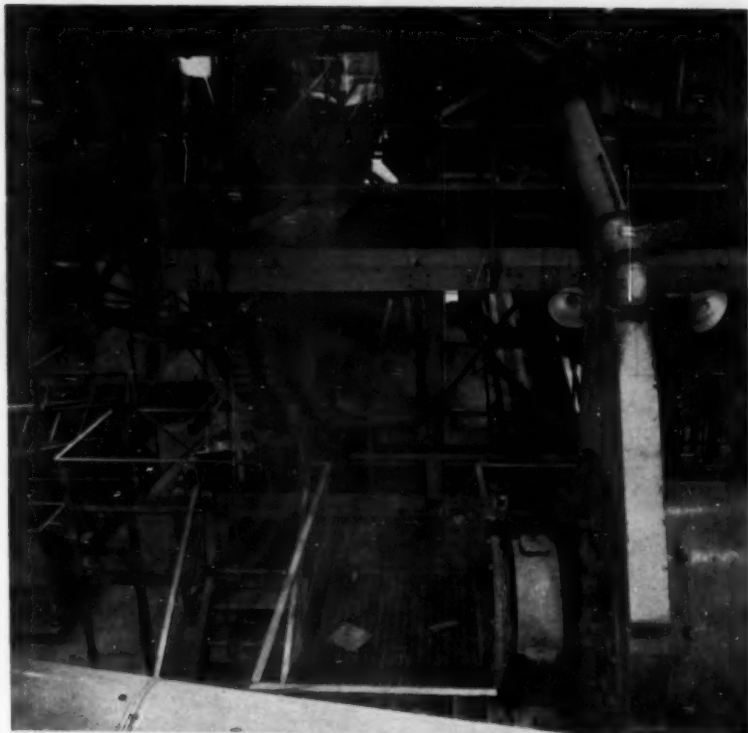
### How the Process Works

The flowsheet is almost unbelievably simple and represents a long step toward the development of the still elusive, best all-around process for treating uranium ore—a problem confronting today's metallurgist. The acid cure is essentially a sulphating step. Blended ores from various shippers, plus ore from Kerr-McGee's own mines in the Lukachukai Mountains near Cove, Arizona, are pugged with water and sulphuric acid (10 and 20 percent by weight of the dry feed tonnage). The mixture cures in piles for six to eight hours, during which time reactions are completed. Uranium, vanadium, a large part of the lime, and some of the iron and aluminum go into solution after the cured mix is repulped and agitated. A sand-slime preparation scalps off roughly 70 percent of the coarse solids. The uranium in the pregnant solution is recovered as an easily filtered ammonium diuranate by processes which include an ion exchange. Following a typical batch of ore through the mill will serve to point out many operating considerations.

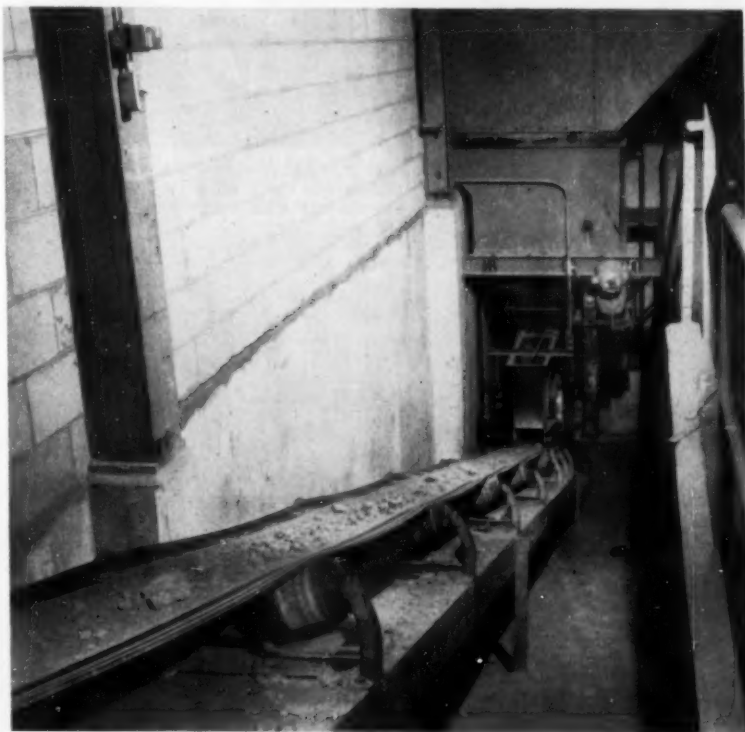
### Ore Stored in Lots

Inbound trucks are carefully weighed and a sample taken for moisture determination. Ore from each mine is kept in separate lots in the stockpile area until scheduled for the sampling plant. Each lot contains a stake bearing the lot number which Kerr-McGee has assigned, the date deliveries started, and the scale ticket number of each truck load. The paper work has just begun here. The plant must keep careful records of each truckload of ore for the purpose of making payments to the various shippers and also for blending mill feed optimum operating efficiency.

Russ Gunn, foreman of the sampling and crushing plant, likes to pick up a lot for sampling when 150 to 200 tons have been accumulated. However, this is complicated by the fact that a shipper may bring in only 10 or 20 tons during a month; yet his ore



GRINDING SECTION of the Kerr-McGee plant is simple but adequate. At the lower right is a Denver rod mill which is in closed circuit with an Allis Chalmers screen (upper right). At left center is the firing end of the Standard Steel drier.

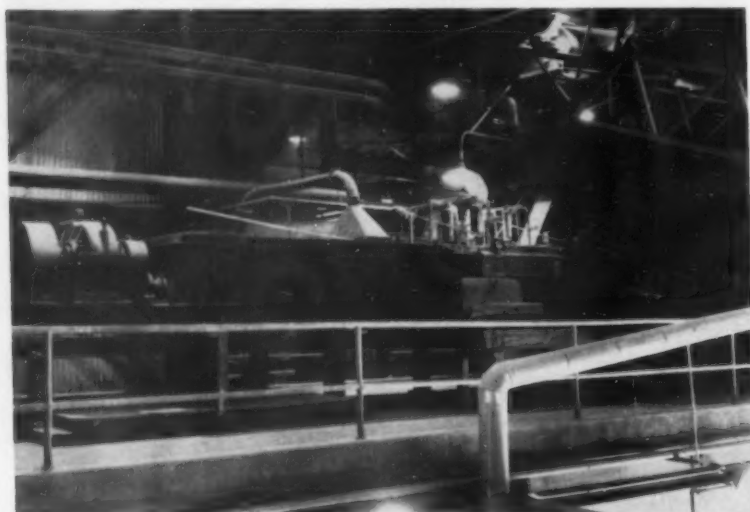


CURED ORE transported by this conveyor is repulped and agitated to dissolve the uranium content. Total agitation in the Wemco machines amounts to about 1½ hours. The next step involves solids-liquid separation.



RUNNING A URANIUM MILL requires good supervision and management. Shown above, on the left, is Clyde Osborn, general superintendent of the Navajo Uranium Division, Kerr-

McGee Oil Industries. On his right is Charles Lindberg, mill superintendent, and Clyde Garman, assistant mill superintendent at extreme right.



ORE MEETS ACID AND WATER in this Allis-Chalmers log washer. The wet mix drops to a small hopper and is then transferred to the outdoor curing area. Reagent addition at the log-washer is measured by Fischer-Porter flowmeters.



PROCESSING OF URANIUM ORE begins here. Incoming ore is stored temporarily in the background area then fed through a sample mill. Rejects are gathered in the hopper loading the mill conveyor or by-passed to bin at left for transfer to stockpile.

must be stored in a separate lot, run through the sampling plant, and payment made by the end of the month. Each lot of ore must be cleaned up and run through the sampling plant by the end of the month in which it was shipped. Gunn closes his books on the 27th day of the month and starts a new month for all shippers. This allows three or four days to run any remaining lots through the sampling plant before the first of the month. The area is literally made broom clean before a new batch of ore is dumped. Needless-to-say, careful planning and foolproof accounting are required to keep track of shipments and payments.

Sampling is done by sending the ore through an automatic sampling plant. A Michigan loader with a 1½-yard bucket picks up the ore in a lot and dumps it on 5-ton trucks. The trucks shuttle between the stockpile area and the grizzly hopper at the sampling plant.

#### Sampling Plant

The grizzly hopper feeds a Universal 15- by 24-inch jaw crusher set at 1½ inches. The crushed ore gathered on a conveyor is cut by a Snyder sampler which collects a sample amounting to nearly 10 percent of the weight of ore handled. The sample is further reduced in a Lippman crusher, conveyed to a Syntro vibrat-ing feeder, and transferred to a second conveyor. The purpose of the vibrating feeder with its small collecting box is to smooth out surges for following sample cuts. The discharge from this conveyor is cut by a second Snyder sampler. The cut here amounts to about ¼ percent of the original feed tonnage. The sample is crushed again and passed through a riffle splitter which is set up to cut an approximate 200-pound portion; however, the size cut taken at this point is governed



by the size of the particular lot being handled. The third cut is dried, reduced in a pilot plant size gyratory, and split again to 50 pounds. This last portion is thoroughly mixed automatically for 20 minutes, and split again by hand to approximately 1,500 grams. This is put up in 100-gram pulps for the company, seller, and umpire.

### **Sampled Ore to Grinding Plant**

Rejects from the sampling plant are gathered and conveyed to a 10-ton hopper which discharges to the mill feed conveyor for transport to the drying and grinding section. Provision has been made on the reject conveyor gallery to by-pass the mill feed conveyor and dump the ore in a 25-ton bin. From here, trucks can shuttle the sampled ore to a permanent stockpile. The sampling plant is thoroughly cleaned by compressed air lines spotted at strategic points before another lot is handled. Nearly 20 minutes are required to blow all crushing faces and samplers, and to sweep out before a new lot can be brought in.

### **Screening, Drying, Grinding**

Mineral liberation from the ore is a relatively simple problem. This is apparent when the facilities installed for crushing and grinding are considered. Following the primary crushing step in the sampling plant, a Denver rod mill is the only other unit installed for size reduction. The bulk of the ores handled are the standstone type with uranium-bearing minerals occurring in the interstices of the sand grains. They are readily attacked by leach solution even at a relatively coarse 10-mesh.

Sampled ore brought in near the top of the mill building on the mill-feed conveyor gallery will average in the neighborhood of 8 percent in moisture content. The ore is screened on an Allis Chalmers, Ripl Flo, single-deck, vibrating screen with 1-inch openings. The undersize (which amounts to 50 percent of the mill feed) is fed to a Standard Steel Company, natural gas-fired rotary drier which operates at 250° F. The 50 percent oversize fraction joins the dried undersize, and the two products are fed to an Allis Chalmers, Thermal Deck, Ripl Flo, double-deck, vibrating screen. The top deck to the screen is fitted with woven wire containing  $\frac{3}{4}$ -inch openings; the bottom deck is fitted with a ton cap screen having 0.069- by  $\frac{3}{16}$ -inch openings. The screen is closed circuited with a Denver rod mill which grinds dry. The

## **Kerr-McGee Highlights**

**ANTI-CORROSION MEASURES** received a lot of attention during construction. As nearly as possible, problems of handling hot acid solutions were anticipated in advance. The problem was two-fold. Not only were slurries corrosive, but also very abrasive. Uscolite plastic piping was installed throughout the mill where temperatures were not extreme. It was selected for most applications in preference to rubber-lined pipe because it is less expensive, light in weight and can be worked with standard pipe cutting and threading tools. It has stood up very well under most of the applications for which it was specifically purchased, and exhibits fair to good resistance to abrasion. It still appears, however, that there is a need for a plastic pipe which is durable, yet able to withstand a hot acid solution. Saran-lined steel pipe and rubber-lined steel pipe are also used in the plant.

The Wemco leaching agitators are rubber lined. The classifier tanks and spirals are also covered with rubber. To date no trouble has been experienced with the submerged bearing, which is made of stainless steel.

**EASE OF LIQUID-SOLID SEPARATION** is one of the most outstanding features of the Kerr-McGee plant at Shiprock. This has long been one of the most irritating problems facing operators of uranium mills. The overflow of pregnant solution from the thickeners contains only two parts of suspended solids per million. This solution is so free of entrained slimes that a filter originally installed has been bypassed. The use of Dow Separan 2610 in combination with reagents developed in Kerr-McGee's own research laboratories at Oklahoma City under Dr. Mayer Goren's supervision has been responsible for the success.

**CAPACITY DOUBLED DURING CONSTRUCTION.** It has been said before that since uranium metallurgy is still in a formative stage, more often than not, the plant is outdated when it begins operation. Expansion begins almost as soon as construction has been completed. The capacity of Kerr-McGee's plant was doubled while it was being erected, yet they opened nearly on schedule. This was possible because of the smaller settling and filtering area requirements than originally anticipated. Instead of the 6-square-feet of settling area per ton of solids per 24 hours first calculated, the figure has been reduced to 2 square feet. Development of flocculating reagents really paid off in this instance.

**THE ACID CURE** used at Shiprock has eliminated large capital investment for roasting equipment normally required in most acid plants. There is no need for pressure leaching equipment such as that employed in mills treating carbonate ores. The Kerr-McGee flowsheet has remained simple, and the measure provided against corrosion have been 90 percent successful. Many of the actual flowsheet details, particularly precipitation, are confidential and cannot be revealed for security reasons.

**WHAT BASIC STANDARDS** must be met in order to construct and operate a uranium processing mill? One authority was asked and he replied "I don't think anyone has a clear understanding about it, but these following basic elements must be present; 1) The company must be financially responsible, 2) It should control or mine a sizeable part of the ore production needed for the plant. This figure is about 50 percent, although it may range from 25 to 50 percent. 3) The company must have a competent metallurgical staff. 4) It must, independently, develop a process flowsheet, estimate costs for building the plant, and estimate costs for operating the plant. 5) Submit the flowsheet and estimate of costs to the Processing Division of the AEC Grand Junction office, for study and approval. 6) Negotiate a contract."

**OTHER PRIMARY CONSIDERATIONS.** The Processing Division of the AEC at Grand Junction has set up 27 metallurgical classifications of uranium ore based on the character of mineralization. In order that a mill can most efficiently serve operators in the region, a method of treatment must be developed which is applicable to the available ores. The ore supply will probably include several metallurgical types.



WHEN A SHIPPER'S LOT is scheduled for sampling, a Michigan loader, shown at the left, picks up the pile and loads a 5-ton truck which delivers the ore to the sampling plant. In



the picture on the right, a loader is picking up a batch of cured ore which will be repulped for processing. The pile in the foreground has been freshly mixed and is curing.

final 10-mesh undersize from the screen is carried by conveyor and distributed by a trip conveyor to three 250-ton circular steel bins. This is the first step in the effort to blend ores making up the mill feed. Ore is drawn from two discharge openings in each bin by Syntron vibrating feeders. The chute leading to the feeder is also equipped with a bin vibrator to maintain a free flow of material to the feeder itself. The Syntron feeders discharge to a common gathering conveyor which loads a bucket elevator. The material discharged at the top of the bucket elevator is distributed by trip conveyor to a second set of three circular steel

bins which comprise final mill feed storage.

#### Good Mixing

Western Knapp, designers of Kerr-McGee's plant, have provided adequate storage capacity, sufficient bin drawpoints, and a number of conveyor transfers to give good mixing. At the first set of three steel bins high lime and low lime ore is stored in separate bins. Provision is also made to segregate high vanadium-bearing ore at this stop, also. The ore withdrawal from any one of these bins can be finely adjusted by a rheostat control on any one of the feeders.

Two Rotoclones collect dust at all transfer points in the grinding and storage plant. The Rotoclone pulp is used for repulping cured ore prior to the agitation step.

#### Mixing For Acid Cure

Ore from the mill storage bins which has previously been weighed and sampled is carried by belt conveyor to a small hopper feeding the Allis-Chalmers mixer. The mixer is essentially a pug mill containing a set of counter-rotating paddles mounted lengthwise on two shafts in the machine. Three flowmeters, mounted at the top of the mixer, measure and control sulphuric acid and water additions to the unit. The amount of acid and water added amounts to 20 percent and 10 percent, respectively, of the weight of the feed. The primary purpose of the water addition is to prevent the set-up or hardening of the curing piles on the concrete deck, caused by formation of  $\text{CaSO}_4$  (Plaster of Paris).

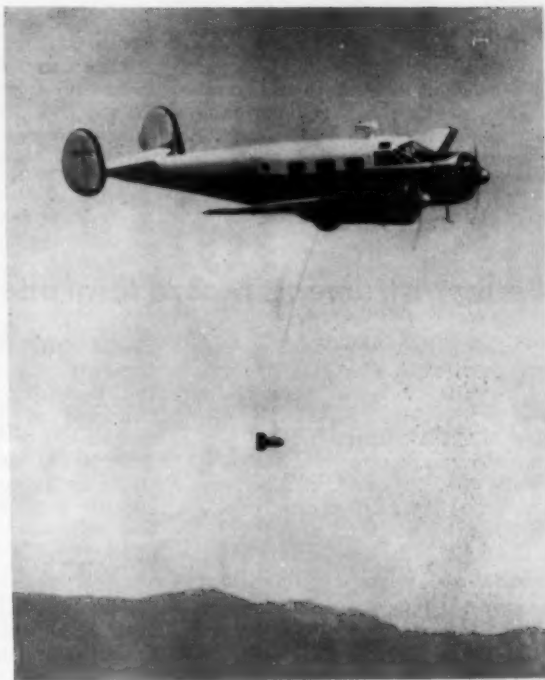
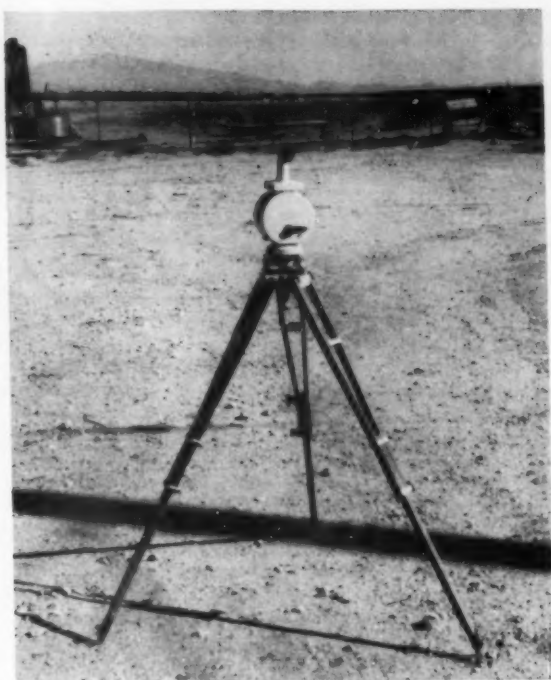
#### Ore Cured Outside

The mixed ore is discharged from the mixer and drops to a small open-sided concrete bin. Front end loaders pick up a load of ore from the bin and transport it some 50 to 100 feet to the outdoor curing area. Two piles are found here. One has already been cured; the other, containing freshly mixed ore is in the process of curing. The operator of the rubber-tired loader alternately carries ore from the mixer to the curing pile, then picks up a load of cured ore and dumps it into a grizzly covered hopper which

(Continued on page 80)



SPIRAL CLASSIFIERS, made by Western Machinery Company, make a sand-slime separation of the solids after the cured mix is re-pulped. Nearly two-thirds of the solids are rejected from these classifiers as a coarse sand tailing.



From the Schmidt type field balance . . . . . to the "spinning atom" magnetometer.

## New Guides to Hidden Ore Deposits

*The following discussion by SIGURD K. HERNESS is the first of two parts dealing with new magnetic exploration methods in delineating uranium and other hydrothermal ore localizations. The second portion of the article will appear in the August issue.*

### Geomagnetics: past use in exploration

Geomagnetic surveys were initiated on a systematic basis after World War I, and reached a utilization peak in the petroleum and mining industries during the thirties. Because of certain initial successes in the determination of petroleum structure and localization, the magnetic procedures enjoyed a period of field application apparently not justified by later experiences. The apparent ineffectiveness of magnetics as an aid to petroleum exploration resulted from treating the magnetometer as a "magic wand," and the inability of physicists to integrate magnetic and geological data.

Another factor which contributed to the dying interest in magnetic exploration was the absence of systematic

methodology which would have permitted regional integration of data and the empirical determination of magnetic and geological inter-relationships. The personnel engaged in geophysical research often subscribed to the dogma that all geophysical phenomena could be readily ascribed to known geological factors on the basis of assumptions and computations, and failed to realize that any assumptions are "likely to be exposed by the propensity of nature to contrive an interpretation that the geologists had not foreseen." For example, none had realized that very large magnetic anomalies are produced by hydro thermal alteration. All these factors have resulted in improper understanding and what Nettleton calls the "ambiguity of magnetic interpretation."

The limited areas on which integrated magnetic investigations were

conducted precluded regional fabric interpretation and classification, and under these conditions it was difficult to distinguish between anomalies resultant of basement susceptibility and those resultant of warp irregularities of the basement surface. Second derivative and residual magnetic map analyses have not contributed materially to the solution of these problems inasmuch as similar anomalies are produced by either deeply buried localized magnetic bodies or shallow lens-shaped bodies.

Since World War II and the development of airborne instrumentation, magnetic exploration enjoyed a comeback which appears to have been of brief duration, and most of the larger petroleum companies have again lost interest due to inability to adequately interpret the data.

Government agencies and mining companies have employed the magnetometer to delineate areas favorable

Mr. Herness is president of Minerals Exploration Research Corporation.

JULY 1955

[World Mining Section—35]

for the localization of ore bodies of high magnetic susceptibilities. This application of magnetics has been limited chiefly to delineation of iron ore bodies, pre-Cambrian gold-pyrrhotite and copper-pyrrhotite bodies, and the magmatic segregation type of nickel-

cobalt-copper mineralizations. Indirect application to ore localization problems has been the delineation of subsurface dikes and intrusive boundaries. By and large the use of magnetics in mining exploration at certain areas such as the Canadian Shield has been

extensive and highly successful. Systematic aeromagnetic surveys have been completed by the Canadian government, and it is expected that published maps will be available on the entire Canadian Shield area within a few years.

## Better Instruments record total intensity

Any historical discussion of geomagnetics subdivides itself into two topics—instrumentation development and interpretative progress. The earliest magnetic instrument for geophysical prospecting was the "dip needle" which consisted of a horizontally pivoted magnetic needle carrying an adjustable magnetic weight. Later research led to the development of the Schmidt-type magnetic field balance which is in present universal use in ground surveying. Either the vertical or the horizontal magnetic component may be determined with this type of instrument.

Government determinations of magnetic elements, such as those of the

United States Coast and Geodetic Survey, involve the use of a rotating coil. If the coil-calibration and rotation speed are known, the earth's magnetic field can be computed on the basis of the measured current generated by the coil cutting the earth's magnetic flux lines. This instrumentation permits determination of the absolute, rather than relative magnetic intensity, since the inclination as well as the maximum horizontal-component direction and intensity is registered. From this data it is possible to compute any other component including the maximum or total intensity. The past use of the variometer (rotating-coil instrument) in industrial geo-

physical investigations has been limited, although recent new design will probably lead to wider application in the future.

During World War II, the flux-gate type, continuous magnetometer was developed and has recently been extensively used in airborne and vehicle-borne surveys. This magnetometer involves a sensing element which orients the detecting unit into the earth's maximum magnetic field. It thus records total intensity rather than any directional component.

Recently the "spinning atom" magnetometer has been developed by Varian Associates who have assigned its use to Hycon Aerial Surveys of Pasadena. The advantage of this instrument is that the absolute total values are recorded rather than the variation from place to place.

## How the magnetometer is put to a new use

The magnetometer is being put to new use as a means of mapping and evaluating hydrothermally altered areas. The effectiveness of this method results from destruction of normal magnetite in the basement and other rocks by hydrothermal solutions genetically related to ore deposition.

Primarily the technique consists of recognition of magnetic negative anomalies produced by hydrothermal alteration. Structure contour maps are

useful if not essential to successful exploration applications, because magnetic negatives may result from synclinal structures as well as hydrothermal solution effects. For example, the basement rocks of the Colorado Plateau uranium areas are deep. The resultant hydrothermal negatives are mild and difficult to distinguish from synclinal structural anomalies. Therefore, structure contour maps should be prepared as a concurrent project with a magnetic survey.

A second important prerequisite to successful utilization of magnetic procedures is the reduction of all observed readings to terms of anomalous negative or positive departure from a standard normal or mean datum rather than the assumption of a base magnetic intensity in the area under consideration. This standardization permits comparison of anomaly character and magnitude at such widely separate places as the Bingham Canyon, Utah porphyry copper and the Leadville, Colorado lead-silver replacement deposits.

## Standardized data for anomaly comparison

The approximate form of the earth's surface magnetic field is that of a polarized sphere with the magnetic poles near the geographic poles. The exact cause of the field is not known. The concept of a magnetized iron-nickel core is not compatible with the fact that all materials lose their magnetic properties above the Curie temperature. The temperature at the core

of the earth certainly exceeds this figure. The field is probably due to electric currents circulating in the metallic core. A relationship between the rotation of the earth and its magnetization is indicated by the approximate co-incidence of its magnetic and geographic poles.

For practical purposes the earth's main or fundamental magnetic field

may be ascribed to the theoretical dipole located near its center. On this field is superimposed the crustal or secondary field produced by the polarization of material of high magnetic susceptibility in the earth's crust. No method has been found to separate the fundamental from the crustal fields, and therefore the mean total or cumulative field is used as datum and is known as the normal field. The normal field is constructed on maps by draw-



ing generalized smooth contours of intensity values determined by a survey.

Because there are hourly, seasonal, yearly, and long range deviations of the earth's normal magnetic field, a datum must be based on observations taken at a given time. The normal magnetic field is analogous to ocean sea-level, and it is apparent that without precise definition of "mean sea-

level" much confusion and great difficulties would be encountered in computing and processing topographic surveys. Inasmuch as the most complete world data on magnetism was compiled in 1945 by the U. S. Coast and Geodetic Survey, the Carnegie Institute, and many other similar organizations, both foreign and domestic, the 1945 epoch is considered the most satisfactory standard datum.

A method is utilized by the Minerals Exploration Research Corporation to reduce all data to this epoch regardless of the time of actual current observation. It thus becomes possible to compare an anomaly in Leadville, Colorado, observed in 1955, with one in Grass Valley, California, observed in 1936, in terms of absolute positive or negative departure from a standard datum.

## How correction for earth's field applied

In order to sharply delineate the magnetic fabric produced by the geological features of the earth, the numerical departure of magnetic intensity from the normal is determined for each station in a geophysical survey. These smaller values or anomalies are in turn contoured. This procedure results in a contour-map showing the detail irregularities of the magnetic surface. The normal correction is designed to subtract that part of the magnetic intensity at any point which is due to the normal magnetic field of the earth and to correct for the normal

magnetic field gradients or increase in magnetic intensity as one approaches the north magnetic pole. This variation will be of little importance in a detailed survey of a small area, but assumes great importance in a regional survey. The correction must be applied to the vertical and total intensities alike, although the normal total is not as great as the normal vertical gradient.

The vertical component of the earth's field varies from approximately minus 67,400 gammas at the south magnetic pole to approximately plus

63,500 gammas at the north magnetic pole. The horizontal component on the other hand, has a maximum value of about 39,000 gammas at the equator and decreases to zero at each of the two poles. In the western U. S. the correction for the vertical component amounts to 10 to 12 gammas per mile north and 2 to 3 gammas per mile east. The difference between the "1945 observed magnetic intensity" and the 1945 normal or mean intensity is the anomalous value. All anomalies therefore are departures from the mean or normal magnetic intensity. If the observed intensity is greater than the normal intensity, the anomaly is plus (+); if the observed intensity is less, the anomaly is minus (-).

## General Geophysical Principles

**THE MAGNETIC FORCE** varies inversely as the square of the distance between two magnetic bodies, that is, between the instrument and the source of the magnetic anomaly. The magnetic force varies directly as the magnetic susceptibility of two bodies. The force also varies directly as the mass of a magnetic body or bodies.

**PARTICLE SUSCEPTIBILITY** is the relative magnetic attraction of individual particles of a mass. Each particle is magnetically polarized, and positive and negative poles of two or more particles are mutually attracted, whereas like poles are repelled. Magnetic particles assume the earth's polarity at the time that the mineral or element is formed. Thus, French geophysicists have determined the earth's magnetic field in North Africa as it was in ancient times by determining the polarity of bricks and slag smelters built by the Romans and Carthaginians. All epigenetic magnetic minerals (metamorphic and hydrothermal) assume the polarity of the earth. Syngenetic magnetic minerals in igneous rocks also assume the earth's polarity.

**AGGREGATE SUSCEPTIBILITY** is the relative magnetic attraction of a mass composed of one or more particles. If the orientation of all particle polar axes is parallel, the magnetic force of all the particles is cumulative or the sum of the particle susceptibilities. Most non-clastic magnetic minerals (in igneous and metamorphic rocks) assume parallel polar orientation which is that of the earth's field.

**CLASTIC MAGNETIC PARTICLES** derived from crystalline rocks and deposited in sedimentary rocks usually

assume haphazard orientation and the aggregate susceptibility is relatively low and not in proportion to magnetic mineral content. The aggregate susceptibility is the sum of excess particle polarity in any one direction and may approach zero even when highly magnetic minerals are involved. Usually, however, if the sediments are water transported and finely divided, partial orientation will result at the time of settling from the transporting medium. However, if the material is coarse, the aggregate susceptibility will often approach zero. (A tertiary outcropping sedimentary formation near Laramie, Wyoming, contains up to 25% titaniferous magnetite as boulders, but no magnetic anomaly can be detected with a ground magnetometer.)

**EFFECTIVE SUSCEPTIBILITY** is the relative magnetic attraction that may be measured by field geophysical instruments such as a magnetometer. Effective susceptibility may be determined with difficulty. From the foregoing discussion it is apparent that the measurement of susceptibility of a pulverized sample of known weight and volume will serve no purpose inasmuch as particle orientation is not taken into account.

**MAGNETIC MINERALS** in sedimentary rocks comprise only a small percentage of the rock and are of clastic origin. The effective susceptibility of sedimentary rocks, therefore, is very low. Most magnetic anomalies then, originate from crystalline rocks such as the pre-Cambrian basement and igneous rocks which contain appreciable hypogene magnetite.

Next Month: The author will discuss the interpretation and evaluation of magnetic data.



INCREASED MINE MECHANIZATION figures importantly in future plans of Montevecchio. Jumbo mounted drills put in blast holes in some of the stopes. In others, air-leg drills or stopers are

used. The company has just recently developed a three-tire truck for jumbos in a drive to eliminate the use of rails and track laying requirements in the stopes.

## Lead-Zinc — How Italy's Biggest Producer Plans for the Future

By F. CREMASCOLI and  
P. ZUFFARDI

Montevecchio S. I. P. Z., Italy's biggest lead-zinc producer, has provided two sure hedges against the lowering grade of its ore reserves—increased mine mechanization and a fully developed research program. The company is guaranteeing the future success of its integrated industry which consists of mines and two mills on the island of Sardinia, a lead smelter at San Gavino (also on Sardinia), and an electrolytic zinc plant at Porto Marghera, Venice.

The grade of Sardinian ore is getting lower and lower as mining goes deeper. A high cost mining system is required to maintain the workings, but a forward looking management, through a planned program of improvements and study, is slashing production costs. Mine production per man-shift is up to 10 tons and ex-

pected to reach 15 tons before too long. Research is uncovering more ore, improving processes and metal recovery, and developing new uses for lead and zinc. Many minor metals are now recovered in the smelting operations, and sales of these products help to defray expenses. The capital which Montevecchio is plowing back in equipment improvement and investigations is well spent. Key facts about the operation are reported here.

### Ore Body

The deposit is a mesothermal (medium temperatures and pressures), steep-dipping, vein system. The country rock has been classified as Silurian sandstones and shales. The vein thickness ranges from several inches to several feet. The maximum is about 100 feet, but average thickness is approximately 12 feet. The deposit has been traced for four miles and explored to a depth of 2,000 feet by underground mining. Extensive diamond drilling has probed the ore body

to a depth of 30,000 feet.

Mineralization is composed of lead and zinc sulphides with minor amounts of silver, copper, cadmium, antimony, arsenic, manganese, tellurium, indium, gallium, germanium, molybdenum, cobalt, gold, bismuth, mercury. Gangue minerals are quartz, carbonates (namely, ankerite, siderite, dolomite, calcite), and small amounts of barite. The average grade of combined lead and zinc varies quite widely in the different veins.

### Plan for the Future

In general, a gradual lowering of the metal content has been observed, with the exhaustion of the richer reserves in the upper part of the ore body and the development and exploitation of the lower portion. In some of the upper zones, lenses of high-grade galena occurred from which it was possible to mine direct-smelting ore; however, the mixed sulphides in deeper sections of the mine are much lower in grade. In 1934 and 1935 the average grade of mine run

Mr. Cremascoli is general manager of Research Laboratories, Montevecchio S.I.P.Z. Mr. Zuffardi is chief geologist, Montevecchio Mines.

ore was 8 percent lead and 6 percent zinc; at the present time it is 3.5 percent lead and 5.5 percent zinc. Although mine mechanization may contribute to lower ore grades due to the difficulty of selective mining, it has raised production. It is foreseen that in the next few years the average grade will get lower; as a matter of fact, most of the new reserves are lower in grade than those now worked.

To face this problem of lowering grade, Montevecchio has established three plans:

1. Reduction of operating costs by improving working methods and recoveries.

2. Production of high purity materials to be sold at high prices.

3. Recovery of minor metals present in the ore.

### Underground Methods

Filled, flat back, over-hand stoping is the general mining system used. Although this is a high cost method, ground and wall conditions advise against a change to a cheaper system. Recently, sub-level stoping has been developed and used in narrow peripheral veins.

Blast holes are drilled by pneumatic machines (stoppers, air-leg drills, and jumbo-mounted units). Either single-use rock bits or forged steel with alloy inserts are now used throughout the mine. Former practice was to use forged steel bits, but it was possible to drill only one foot of hole before resharpening. The substitution of the single use bit has boosted this footage to 10 to 42 feet per bit, while with the alloy insert steel about 1,000 feet per tool are realized with three regrindings. The importance of this change can be readily realized when one considers that when using the old style steel it was necessary to have about 3,000 tools in circulation (1,000 at the drilling faces, 1,000 in the reconditioning plant, and 1,000 in distribution). In addition, labor requirements are now smaller since the necessity for nipping has diminished.

### Jumbos in Stopes

Jumbos are now used for drilling vertical holes in the overhand stopes. In this way 200 to 300 feet of hole (8 feet deep) per man-shift is now possible. Not more than 135 to 200 feet of hole (6.5 feet deep) per man-shift was possible with stoppers. A new, three-tire truck has recently been built to substitute for the normal four-wheel rail jumbo.

Mine car loading is done by rail-mounted muckers which handle 50 to 75 cubic yards per shift. One man operates the loader and shoots the



LOCATION of Montevecchio S.I.P.Z. operations.

large blocks. For comparison, the figure for hand-mucking is about 7 to 9 cubic yards per man-shift.

### Fill Distribution

Until 1952, distribution of fill in the stopes was done by shaking conveyors which were operated by 8 horsepower compressed air motors. Their work load was 70 cubic yards of fill material per shift spread along stope lengths of 60 feet. In 1953 the Montevecchio technical crew engineered a rail-mounted self-dumping, 2.2-cubic-yard-capacity car called Ercolino (Little Hercules). The Ercolino is powered by a 5-horsepower, compressed-air motor and can haul another car of identical capacity at an average speed of about three miles per hour. In this manner 350 cubic

yards of fill can be spread along 150 feet of stope with one trammer and three men setting the rails.

New ways of eliminating the use of rails in stopes for fill distribution are constantly being sought. During 1954 experiments were made on new tire-mounted units for use in the fill cycle. First a 2-cubic-yard self-dumping car driven by a 6-horsepower, compressed-air motor was developed and successfully adapted to fill distribution. Through these improvements, track is gradually being eliminated from the stopes and good savings are obtained. In October 1954 the production of some stopes (not yet completely equipped with tire-mounted engines) was 10 tons per man-shift, including drilling, blasting, barring down, mucking and filling. The goal of 15 tons per man-shift is expected to be reached soon.

### Haulage and Hoisting

Underground haulage is done by 11-horsepower Diesel locomotives, or by 6- or 9-horsepower battery trammers. Four shafts open the mine and all are equipped with cages. The Sartori shaft is the only one fitted with automatic devices to load and unload the mine cars from the cage both at the surface and underground stations. Approximately 800 tons per day (16 hour hoisting day) can be handled in this shaft. The Sanna shaft has a capacity of 350 tons per 16 hour day, while the Amsicora and Casargiu shafts each are capable of 150 tons per day.

A new haulage level, 4 miles long, will be driven in order to collect all the ore from the workings for hoisting at the Sartori or Sanna shafts. It is planned to convert from cage equip-

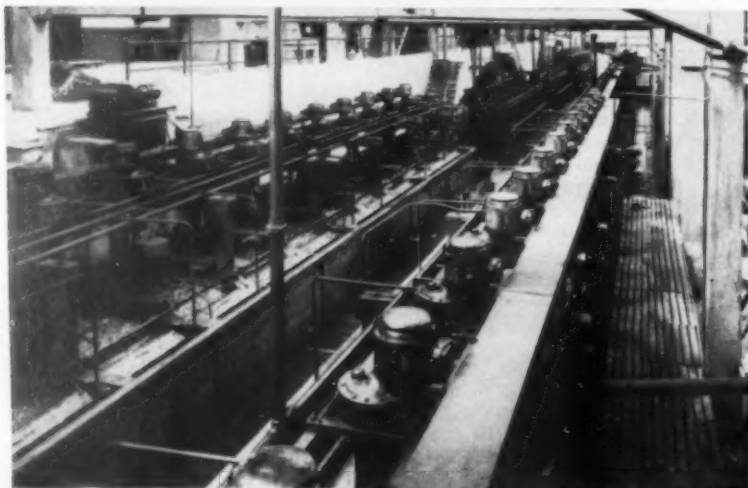


ORE PRODUCTION from the fully integrated Montevecchio operation begins here. Shown above is the Sartori shaft and the Eastern mill on the island of Sardinia. The company has 5 modern research laboratories where special problems are studied.





CASARGIU SHAFT and ropeway terminal, shown above, is one of the smallest of the four main shafts operated by Montevecchio. Plans for a new low-level haulage tunnel call for hoisting ore from two shafts only in the future.



FLOTATION CELLS at the Western plant treat material which has previously been preconcentrated by sink-float. After secondary crushing, plus 4 millimeter particles are fed to the sink-float system which rejects 30 to 40 percent as waste.



ZINC PRODUCTION from Montevecchio's electrolytic plant at Porto Marghera amounts to 18,000 tons per year. New leaching techniques employed by the company permits the recovery of indium, gallium and germanium from concentrates.

ment to skip hoisting to round out this program.

Exploration is carried out by drifts, crosscuts, and diamond drilling. Seven machines are used in the drilling program. Four of them are able to drill short holes (360 feet) in any direction from underground stations; one is employed to drill medium length vertical holes (1,000 feet) from underground positions; and two surface diamond drills can put down 20,000- to 36,000-foot vertical holes.

### Concentration

The ore hoisted at the mine is treated at Montevecchio's two modern concentrators known as the Eastern and Western plants. The flowsheet of each mill is identical and features preconcentration by sink-float with differential flotation of lead and zinc sulphides.

After primary and secondary crushing, a portion of the feed (plus-4-millimeter and minus-1 $\frac{3}{4}$ -inch) is routed to the sink-float system. Here, 30 to 40 percent of the material is eliminated as a coarse tailing while the sink product enters the grinding and flotation section. The installation of the sink-float plant has increased the working efficiency of each mill. At the present time both the Eastern and Western plants are operating at about two-thirds capacity, but as the lower grade ores on the lower levels are developed, mine tonnage will be increased to maintain a normal output of concentrates. The actual production is 20,000 tons of lead concentrate and 35,000 tons of zinc concentrate per year.

The waste from the sink-float system provides an excellent fill material for the stopes at a very low cost. The float produces about two thirds of the total required fill; the remainder is acquired from exploration and from two quarries.

Lead concentrate contains small quantities of copper, but it would be impractical to attempt to obtain a copper concentrate. Instead a matte is produced in the smelting operation and copper recovery is more convenient during that process.

A mining geology research laboratory is operated at Montevecchio to control exploration work and drilling, as well as to make geologic investigations and petrographic studies. Geochemical explorations are being carried on in the entire zone surrounding the mining area. In addition, investigation of possible mineralized areas, both in Sardinia, the Italian peninsula, and foreign countries, is conducted.

### Lead Smelter

The San Gavino smelter produces about 25,000 tons per year of thermal



refined and electrolytic refined lead from its blast furnaces. Smelter by-products include antimonial-lead used essentially to make shot-balls, high purity electrolytic silver and black copper (95 to 97 percent Cu). The electrolytic lead refining plant is now being enlarged to produce larger quantities of high purity lead with a low bismuth content from bismuth-rich lead bullions. The smelter treats all lead concentrates from Montevecchio mines, as well as some ores and concentrates from other Sardinian mines. The smelter is connected to the mine by a narrow gauge railway.

### Smelter Flowsheet

The flowsheet is Parkes process. Roasting is done on Dwight-Lloyd machines which produce a clinker containing 1.5 percent sulphur and 42 percent lead. The lead bullion, obtained from the blast furnaces, then goes through several thermal refining steps. Drosses, consisting of copper-lead, complex sulphides with allied bismuth, and minor impurities, are skimmed from the bullion in the first operation. These drosses are sintered and treated in tilting furnaces to produce copper matte and "bad lead," which contains the bulk of the impurities. The matte is fed to converters and black copper recovered. The bad lead is refined electrolytically using a sulphuric acid electrolyte (L. Cami and R. Piontelli patent). High purity lead is obtained from the cells, and silver and copper recovered from the anode slimes.

In the second thermal refining operation, antimony is oxidized by blasting air into the bullion. The antimony oxide skimmings are used to make antimonial lead (contains 2.2 percent Sb). This alloy is used in a modern shot-ball plant which operates at the plant. The process is based on a new process of imbossing antimonial lead wires (covered by Italian patent).

Lead-zinc-silver alloys are obtained in the third thermal refining step. From these alloys a high-grade electrolytic silver (99.999 percent Ag) is prepared. Newly developed methods also recover zinc from the alloy produced in the third refining operation.

A Lead Research Center, located at the smelter, carries on studies of smelting problems. The modern laboratory is equipped with a spectrograph, polarographic equipment, a spectrophotometer, a photocolimeter, and optical microscopy instruments.

### Electrolytic Zinc Plant

The installation at Porto Marghera (in Venice) produces about 18,000

tons per year of electrolytic zinc which supplies the plate making, pipe and wire making facilities of the plant.

Eighty-five percent of the roaster gas is recovered for the production of approximately 36,000 tons of sulphuric acid each year. The feed for the plant consists of zinc concentrates from the Montevecchio mines and some concentrates handled for other operators on a custom basis. High purity zinc (99.9935 to 99.9865 percent) is normally made although provision for producing special high-grade (99.999 percent) zinc for Zamac type alloys and brass requirements of the fabricating section has been incorporated.

The overall recovery of zinc in the feed amounts to 96 to 98 percent. Several byproducts are recovered at the plant, among which are: 85 percent of cadmium (99.95 percent grade); 95 to 96 percent of cobalt, copper, lead, and silver; and 90 percent of thallium. New processes have

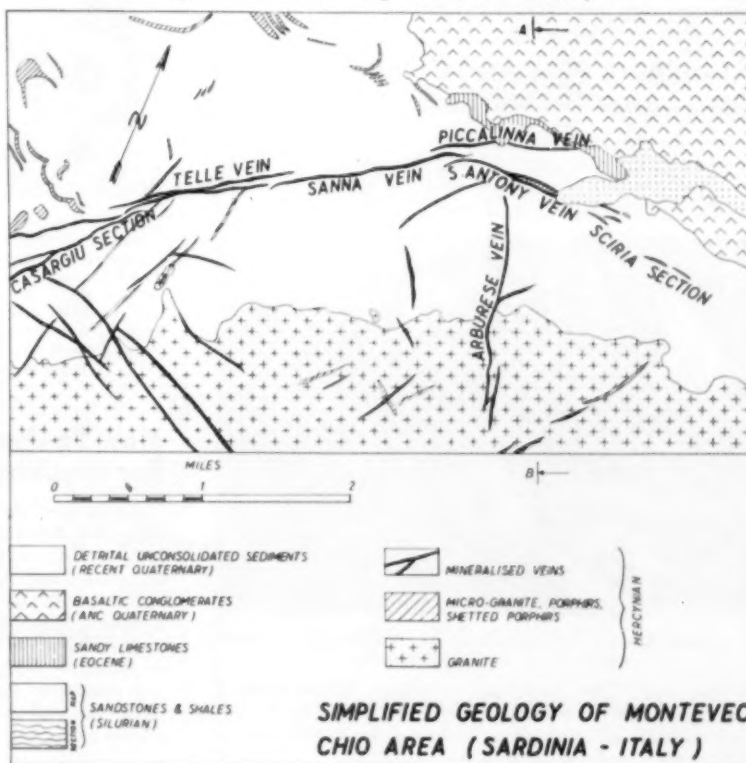
been developed to obtain indium, gallium, and germanium from the leach slimes. Iron contained in the slimes is recovered and used for ferrous sulphates. Manganese dioxide, contained in the anode slimes, is used to produce depolarizers for dry cells, or to make high purity manganese by a newly developed electrolytic method.

### Other Research Centers

A complete well-equipped research center is also maintained at the zinc plant. In addition, Montevecchio has established research centers at the University of Milan where current studies are underway on microorganism influence on zinc, zinc alloys, lead, and galena. Another center was created at Turin in cooperation with Montepioni Company to investigate new processes in making lead, zinc, their alloys, and minor associated metals. Another important function of the latter establishment is the development of new uses for lead and zinc.



CROSS-SECTION Through Montevecchio orebody.



SIMPLIFIED GEOLOGY OF MONTEVECCHIO AREA (SARDINIA - ITALY)



## Cemented Rock Bolts Hold at Galena

Heavy ground on the 3,400-foot level of the Galena Unit of the Vulcan Silver-Lead Company has been successfully held by use of cemented rock bolts. The Galena Unit is operated by the American Smelting and Refining Company, and mine development was described in the February 1955 issue of MINING WORLD, pp. 52 to 55. This heavy ground was found in a faulted and sheared zone paralleling the main haulage way near the shaft station and adjacent to the ore pocket.

A series of 1¾-inch diameter holes were drilled in a diamond-shaped pattern on four- to five-foot centers into the wall to a depth of six feet. These were filled with quick-setting cement mixed to a doughy consistency. A tamping stick was used to fill the hole with cement. Slot and wedge-type bolts, one inch in diameter were then placed in the holes. Chain link fencing, flat wire rope, and 24- by 24- by ½-inch, steel-bearing plates were installed to determine the best type of material for lagging between bolts.

Since the installation some of the steel plates have started to cup from the swelling ground, although the cemented rock bolts have not slipped.

## Aluminum Pipe And Coupler Save Labor On Air Lines

Lightweight aluminum pipe for compressed air lines is gaining favor for open pit work because of the saving it makes possible in time and labor. A 20-foot length of pipe weighs only 15 pounds and can be handled easily



Aluminum pipe air line at right is connected to a steel pipe manifold by the Wade coupler.

by one man. The aluminum couplings which connect two pipes can be assembled in a few sections. In the accompanying photograph, a Wade coupler is shown connecting the aluminum pipe to steel manifold.

The Wade coupler can be connected or disconnected in a matter of seconds by inserting or pulling a single pin. A ring and lock-bar are bolted to each end of a pipe section. When the pipe is pushed into the coupling, the lock-bars are fastened to the coupling cylinder with a pin and safety latch ring. A rubber or neoprene gasket inside the cast aluminum coupling seals against air leakage.

## Inspiration Chute Gate Affords Fast Loading



To insure the positive chute control required by their automatic underground loading system, Inspiration Consolidated Copper Company uses their own design of reverse-guillotine chute gate. The two arms extending upward from the edges of the gate prevent the gate guides from filling with small ore particles that would otherwise bind the gate in the guides and interrupt smooth, fast operation. An air cylinder mounted beneath the chute powers the gate. A series of these gates are operated together to allow fast, multiple-car loading.

## How To Use A Front End Loader For Mucking Out Inclined Shaft

An inclined shaft 2,000 feet long, 22 feet wide, 12 feet high, and dipping 17 degrees 21 minutes and 14 seconds has been successfully completed at a new gypsum mine at Shoals, Indiana. All broken muck from the shaft was loaded into five-cubic-yard side dump cars with Caterpillar HT4 front-end Traxcavator loaders and hoisted to the surface.

Track near the bottom of the incline is carried off-center as shown in the accompanying picture so that the loader can operate in the bottom with room to spare. A second track is carried several tens of feet from the face. A switch, which is moved down the incline as the shaft is sunk,

(Continued on page 67)

## BUNKER HILL & SULLIVAN MINING AND CONCENTRATING CO.

Mines and Smelter at Kellogg, Idaho

### Buyers of:

Lead ores and concentrates, zinc concentrates, silicious gold ores.

### Sellers of:

"BUNKER HILL" brand of refined Pig Lead, Slab Zinc, Cadmium crude Antimonial Lead and Leaded Zinc Oxide.

We are proud of our "BUNKER HILL" trade mark. It represents the highest quality of metals produced. We likewise strive to make "BUNKER HILL" known as a symbol of the highest quality in our relations with our employees, with our suppliers of ores and concentrates, with our stockholders and with the general public.

For information regarding ore rates and shipments  
Address:

**BUNKER HILL SMELTER**  
**Box 29**  
**Kellogg, Idaho**

## AMERICAN ZINC, LEAD AND SMELTING COMPANY

Buyers of Zinc Concentrates  
Suitable for Smelting in Retort  
and Electrolytic Smelting  
Plants, also Buyers of High  
Grade Lead Concentrates.

*Address Communications to Ore Buying  
Department*

Paul Brown Building  
ST. LOUIS, MISSOURI

423 Mills Bldg.  
EL PASO, TEXAS

927 Old National  
Bank Building  
SPOKANE, WASHINGTON

P.O. BOX 577  
DUMAS, TEXAS

## International Smelting and Refining Co.



*Buyers of*

Copper, Silver & Gold  
Ores and Concentrates:

Copper Smelter—Miami, Arizona  
Address: Ore Purchasing Department  
International Smelting and Refining Co.  
P. O. Box 1265  
Miami, Arizona

Lead & Zinc Ores  
and Concentrates

Lead and Lead-Zinc Smelter }  
Lead-Zinc Concentrator } Tooele, Utah

Address: Ore Purchasing Department

**International Smelting and Refining Co.**

**818 Kearns Building**  
**Salt Lake City, Utah**

Please establish contact prior to shipment.

## MAGMA COPPER COMPANY

*Buyers of*

**COPPER, GOLD**  
**AND SILVER ORES**

**MINES AND SMELTER AT**  
**SUPERIOR, ARIZONA**

John D. Mitchell Tells of

## LOST MINES AND BURIED TREASURES THE MUSICAL MOUNTAIN



In the old Truckee mining district, down the Truckee River near Pyramid Lake, is situated Nevada's Musical Mountain. This mountain was discovered by the white settlers in 1863.

"Each evening after dark," says an old account, "when the air was calm and all was quiet, a mysterious concert began. Out from the face of the big mountain were wafted soft strains that seemed to cause the whole atmosphere to quiver as they floated over the mining camp. The eerie music seemed to pass over the camp until it was far away and almost lost in the distance. Then, beginning with a tinkling sound as of many silver bells, there would be a fresh stream of sweet notes all over again."

The story told among the old-time Mexican miners and the Indians was that in the days of the padres a large Spanish *conducta* (pack train), on its way to the City of Mexico with treasure, was waylaid at the foot of the mountain. After concealing the treasure in the soft earth, the Spaniards put up a terrific fight, but eventually all were killed. The old-timers believed, as did many of the more superstitious among the white settlers, that the music was the voices of the dead *patrones* who had been left to guard the treasure.

The weird music and wailing sounds did not occur daily, but seemed to come only when atmospheric conditions were favorable. The more devout among the Mexicans and Indians always crossed themselves and murmured a prayer when the music started. None among them was brave enough to search for the great treasure which they firmly believed to be guarded by the strange voices coming from the mountain. They refused absolutely to go near it and cautioned their children against doing so.

Mystery was added by the fact that the strange sounds were never heard during the daylight hours. They only occurred on dark dreary nights when all was quiet around the old mining camp. The only other sound carried by the still night air was the continual hoo-hoo of the owls that reared their broods in the deserted mining shafts. Coyotes and bobcats never cried out on the nights that the weird music or voices floated through the air.

There finally came the time when the more venturesome among the miners and old settlers, aided by a goodly supply of liquid refreshments, worked up sufficient courage to go to the mysterious mountain one dark night and make an investigation. After lengthy consideration, they

decided that the strange sounds were not caused by the winds. They reported that the whole face of the Musical Mountain was covered with thin flakes of a hard crystalline rock which was continually sliding down the mountainside and forming huge drifts at the base. In their opinion, they said, the eerie musical sounds were caused by friction when the tiny particles rubbed against each other. A few of the party, those of a more scientific turn of mind, were convinced that the rising and falling temperatures of day and night had something to do with the ghostly music.

None of the old-timers took the legend seriously enough to look for the hidden treasure. However, many years later someone going through old records left by the Spaniards discovered that a Spanish *conducta* actually was attacked at that very place and, as was the custom, had buried the treasure just before the battle took place.

The weird voices of the long-dead *patrones* and the tinkling musical sounds of Musical Mountain still guard the great treasure that is said to lie beneath the shifting sands.

### THE PROSPECTOR

Where is the prospector of long ago  
With his burro and pack and sour  
dough  
Who roamed the hills with pick and  
pan  
And gouged the ledge where the  
values ran.  
He worked like hell for the little he  
got  
And seldom owned the proverbial pot.  
He's displaced today by the modern  
guy  
Who plumbs the earth and flies the  
sky  
With a radar gadget called a seeing  
eye;  
He samples the earth and bark of trees  
And takes the count of flying bees  
And draws queer lines he calls a  
"high"  
and says "drill here" to you and I.

Things have changed a lot indeed  
With modern techniques and awful  
speed  
And yet, somehow it seems to me  
That better off we all would be  
If we could take our pick and pan  
And roam the hills with that good  
old man.

By J. E. Van Gundy  
Spokane, Washington





## United States

# Personalities in the News



**ROY H. GLOVER** (left) has succeeded **CORNELIUS F. KELLEY** (right) as board chairman for Anaconda Copper Mining Company. Mr. Kelley announced his retirement at the firm's annual meeting of stockholders in Butte, Montana. Mr. Glover, a lawyer, joined Anaconda in 1943 and is general counsel, a vice president and a director of the copper producing firm. A member of the mining industry for half a century and at the helm of Anaconda for 37 years, Mr. Kelley's career has run a span from a \$1.00-per-day job as a water boy on Butte Hill in Montana to head of one of the largest mining companies in the world. Among his later achievements as head of Anaconda were revitalization of Montana copper operations with the Greater Butte Project; expansion of the Chile Exploration Company in Chuquibambilla, Chile; development of the Yerington, Nevada operation and the Cananea project in Mexico; and expansion of the firm into the fields of aluminum and uranium.



**M. J. O'Shaughnessy** has been named assistant general manager of the Nevada Mines Division, Kennecott Copper Corporation, replacing **Paul Hett**, who resigned because of ill health. Mr. O'Shaughnessy has served as division industrial engineer since March 1954. Before that time he worked for various mining companies in Canada. Kennecott also announced that **Frank Quilici**, formerly with Isbell Construction Company, will direct operations at the Liberty and Veteran Pits, McGill, Nevada.

Board of directors of Continental Uranium, Inc. were re-elected at the company's annual meeting of stockholders in Chicago. These include **Gerald S. Gidwitz**, chairman; **Joseph L. Gidwitz**, vice chairman; **Willard Gidwitz**, and **Raymond G. Sullivan**. Continental Uranium, Inc. has field offices in the Continental Uranium Building, Grand Junction, Colorado.

**Vernon Pick**, Colorado Plateau uranium figure, has announced the appointment of **Alan Humerickhouse** as administrator of the Pick Foundation, which has been set up for philanthropic

cal work in education and research. Mr. Humerickhouse, formerly pastor of the University of Minnesota Episcopal parish, will also handle personnel and public relations for the Pick enterprises. He will maintain headquarters in Grand Junction, Colorado.

**Merton I. Signer**, International Minerals & Chemical Corporation, was recently promoted from mine engineer to exploration superintendent. He will be in charge of all exploration and preliminary development of the firm's Canadian potash lands.

**A. L. Pratt**, Salt Lake City, Utah, has been named traffic manager of the Utah Copper Division, Kennecott Copper Corporation.

**Robert H. Bassett**, consulting chief engineer for Minnesota operations, M. A. Hanna Company, retired after nearly 38 years of service. He had been chief engineer from 1925 to 1950 when he was named consultant.

**Joseph E. Gordon**, mine foreman, has been promoted to assistant mine superintendent of Bunker Hill and Sullivan Mining & Concentrating Company. He is in charge of all underground operations of the company. **Roy Hooper** is mine superintendent.

**Morris F. LaCroix**, president of White Pine Copper Company, Michigan, was honored by the town of Ontonagon, Michigan at ceremonies in June for his part in the economic development of the Upper Peninsula community. A "White Pine Copper Days" celebration was held in observance of the beginning of full-scale copper production at the \$80,000,000 operation, which has more than doubled copper production in the Upper Peninsula region.

**James Ivers, Jr.**, superintendent of the Homer mine, M. A. Hanna Company, has announced his resignation. He is leaving Michigan to take an assignment with an engineering firm in Salt Lake City, Utah. **Kurt R. Kuehlthau**, general operating engineer, was named to succeed Mr. Ivers at the Homer mine.

**William D. Trevenna**, Helena, Montana, has been named state quartz mine inspector by the Montana State Board of Examiners.

**George Kneass**, Foote Mineral Company, was promoted to Mineral Plant Supervisor of the Exton, Pennsylvania plant. He has been in various production jobs for Foote since 1951, including 2 years as mine assistant at the Sunbright, Virginia plant.

**Robert R. Estill**, formerly with United States Steel Corporation, was elected president of Green River Steel Corporation, Owensboro, Kentucky. During the post World War II period he served as American chairman of the United States and United Kingdom coal control board in Germany. Outgoing president **Sidney D. Williams** has been named vice chairman of the board. **William C. Fisher** remains as chairman.

**Gust Weggum**, mechanical consultant for The M. A. Hanna Company's Minnesota operations, has retired. He had been with the firm since 1905.

**B. H. ENSIGN**, sales engineer with the Galagher Company, Salt Lake City, Utah, recently made an inspection trip of various Galagher installations on the West Coast. While in San Francisco he visited the offices of the Utah Construction Company, Bechtel Corporation, Kaiser Engineers, and Westvaco Chemical Division of Food Machinery and Chemical Corporation.



**Roger M. Blough** has succeeded **Benjamin F. Fairless** as chairman of the board and chief executive officer of United States Steel Corporation. Mr. Fairless, who has been named president of the American Iron & Steel Institute, will continue as a member of the board of directors and the finance committee of the corporation. Mr. Blough was appointed general solicitor for U. S. Steel in Delaware in 1942. In 1951 he became executive vice president and director and later was elected vice chairman of the board.

**Andrew T. Sweet**, mining and metallurgical engineer, has joined Overland Oil, Inc., Denver, Colorado, to direct commercial development of the firm's newly acquired process to extract uranium from ore. Mr. Sweet, a former director of metal research at the Michigan College of Mines, resigned from the U. S. Bureau of Mines to accept the position with Overland.

**Matthew R. Banovetz**, Reserve Mining Company, was appointed superintendent of pelletizing at the Babbitt, Minnesota plant. He has been with Reserve since 1951.

**Edward W. R. Butcher**, chief mining engineer for Republic Steel Corporation's Northern Ore Mines has retired after 37 years in this position.

**SPENCER S. SHANNON** has been named director of the new Office of Minerals Mobilization, U. S. Department of the Interior. The office will carry out functions authorized by the Defense Production Act of 1950 with respect to strategic and critical metals and minerals. Since 1939 Mr. Shannon has been engaged in private consulting work in mining and related fields and has held a number of major positions in the Federal Government. He has served as a consultant to Assistant Secretary for Mineral Resources, **FELIX E. WORMSER**, since January 5, 1955. He was a member of Secretary of the Interior **DOUGLAS MCKAY**'s survey team for the Bureau of Mines, and in 1951 was a special assistant to the Administrator of the Reconstruction Finance Administration on tin, rubber, and abaca. Prior to 1939 he spent nearly 20 years with the Shannon Company, Dudley, Pennsylvania, and the Carbon Coal and Coke Company of Boston, Massachusetts.



**DICK W. PEHL** was appointed to the position of assistant superintendent of Mechanical Shops at the Kaiser Steel Corporation plant, Fontana, California. Mr. Pehl was formerly general foreman and has been with the company since 1949 when he joined as a production assistant. Before coming to Kaiser Steel he worked for Fairbanks Morse and the engineering firm of Bechtel and McCone.



William J. Egan, engineer in the Mining Division of the U. S. Atomic Energy Commission, will be in charge of the Salt Lake City, Utah office which has been set up to serve the public in matters dealing with uranium mining and ore procurement. The Mining Division office is located in the Federal Building, adjacent to the AEC's Salt Lake Exploration Branch.

Henry S. Schaufus, Vanadium Corporation of America, was recently appointed chief metallurgical engineer. Mr. Schaufus has an extensive background in the field of metallurgy dating back to 1929. He has been associated with Crucible Steel Company of America, Eastern Stainless Steel Corporation, and Rustless Iron and Steel Corporation.

New research metallurgist with the Development and Research Division

of the International Nickel Company, Inc., New York, is Eugene H. Kinelski. Formerly with Inland Steel Company, Pullman-Standard Car Manufacturing Company, and Sintering Machinery Corporation, Mr. Kinelski will work in the welding section of the research laboratory at Bayonne, New Jersey.

John R. Ellis, Casper, Wyoming, has established a consulting service for oil, gas, and uranium. Previously, he was employed as a geologist with the consulting firm of Jenkins & Hand and had concentrated on work with uranium during the past few years. He has also had experience with the Carter Oil Company in Montana, Oklahoma and Wyoming.

B. H. Martin is now with Uranium Enterprises, Phoenix, Arizona.

Michael A. Scheriff is superintendent of mill and mines at Deming, New

Mexico, for the General Chemical Division of the Allied Chemical and Dye Corporation.

Langbourne M. Williams, president, Freeport Sulphur Company, was elected chairman of the National Industrial Conference Board.

William F. Jamieson, formerly with United States Vanadium and Consolidated Copper Corporation, has been appointed chief mining engineer for Moab Mines, Inc., Moab, Utah.

Royal S. Foote, head of the Geophysical Exploration Branch, Raw Materials Division, United States Atomic Energy Commission, has resigned his position to form the Resources Development Corporation. The new company, with headquarters in New York City, will function as uranium and mining consultants and exploration specialists and will offer advisory services in radiation instrument development.

Frank Sims and Rafael Salgado, miners at the San Manuel Copper Corporation's Red Hill mine in Arizona, and Donald Salter, Bagdad Copper Corporation, have received recognition from a national safety organization. The three men, who were among 14 life-saving heroes throughout the nation, were awarded the Joseph A. Holmes Safety Association medal for their acts of bravery during mine accidents.

H. A. Ziebell, superintendent of the Northwest Magnesite Company, Chewelah, Washington, has been named state chairman of a committee to plan the National Meeting of the American Mining Congress in Las Vegas, Nevada October 10-13.

Marvin A. Hustad, former MINING WORLD field editor, has accepted a position as an engineer at the Danube iron mine in Bovey, Minnesota, which is operated by Pickands Mather & Company for the Balkan Mining Company. Mr. Hustad has also worked at the Black Rock Mining Corporation's Lincoln mine near Tempiute, Nevada (now a Wah Chang Mining Corporation operation), and for the New Jersey Zinc Company.

Ray Schultze, mine superintendent of the Madison mine, National Lead Company, Fredericktown, Missouri, has resigned to accept a similar position with the Atlas Mining Company, Green River, Utah. Ken Nobs, formerly superintendent at Baxter Springs, Kansas, for National Lead, is general superintendent for Atlas.

Harold L. Price will head the Division of Licensing, United States Atomic Energy Commission, which has been set up to handle licensing of private atomic energy activities. Mr. Price leaves the post of deputy general counsel for the commission to assume the new position. He has been with the AEC since 1947, and will continue to make his headquarters in Washington, D. C.

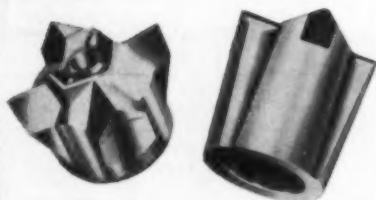
H. B. DuBois has been named assistant manager for the Consolidated Feldspar Department, International Minerals & Chemical Company. The firm also announced that W. K. Burris has joined the department as sales manager, the post previously held by Mr. DuBois. Both men will make their headquarters at Erwin, Tennessee.

# LIDDICOAT

Used-to-destruction • no resharping



## the bit for fast feed leg drilling



### LIDDICOAT BITS

... and feed leg drilling machines ... you just can't beat this speedy, cost cutting combination! Designed for efficient, low cost operation, Liddicoat is the bit that is used-to-destruction and then discarded ... no resharping ... no delays ... no extra costs ... the ideal bit for easier drilling with feed leg machines.

**NO THREAD SOCKET.** ... The socket of the Liddicoat Bit is accurate to thousandths of an inch ... precision that means a stronger connection and longer bit life. Of prime importance is the strong attachment without threads. Forged within the socket of the bit are flats between the rounds. Any turning of the rod within the socket tends to lock the bit tightly to the rod, yet is easily removed. For details, write us or call a reliable Liddicoat dealer.

### LIDDICOAT TEE CEE BITS

... as shown at right above, is a tungsten carbide insert bit designed for on-the-job interchange with Liddicoat used-to-destruction bit ... both fit the same drill steel. Now, you can switch to the most economical bit — right on the job — on the same steel — to meet varying ground requirements. No delay whatever!

The most  
popular bit  
for roof  
bolting.

**WESTERN**  
*Rock Bit Manufacturing Company*  
552 West 7th South • Salt Lake City 4, Utah

# Newsmakers in International Mining



The above picture was taken during the visit of DR. ALLEN BATEMAN, Yale University, New Haven, Connecticut, to the Dongri Buzurg Manganese Mines in Madhya Pradesh, India. From left to right are: S. K. BAROAH, director of geology and mining, government of Madhya Pradesh; T. P. DAS GUPTA, consulting geologist; S. K. BHATTACHARYA, geologist and superintendent of mines, Manganese Group of Mines, Madhya Pradesh Mines Ltd., Nagpur; PROFESSOR KILPADE, head of the department of geology, Nagpur University; DR. BATEMAN; S. C. CHAKRAVARTY, geologist, Geological Survey of India; MR. HENSEL, manager, Dongri Buzurg Mines; MR. VENKATESH, geologist, Geological Survey of India.

D. T. Mitchell, assistant general manager, and A. Blatchford, chief geologist, Emperor Gold Mining Company, Ltd., Vatukoula, Fiji, have been touring the United States and Canada. They have been studying methods and equipment and various mining operations in the two countries.

Ralph D. Parker, general manager of Canadian Operations, was elected vice president of the International Nickel Company of Canada, Ltd. He also holds the title of president of Canadian Nickel Company, Ltd., the exploration and prospecting subsidiary of Inco.

Ken Dewar, superintendent of the Errington Mine, Steep Rock Iron Mines, Ontario, Canada, has left that company to take up consulting work in Toronto, Canada. Wyatt Hegler, senior mine captain, has been named new superintendent of the Errington No. 1 mine, and J. H. Chesney, junior mine captain, has become mine captain.

B. I. F. Breakey, formerly with Con-west Exploration, has joined the staff of Rio Canadian Exploration Ltd. as assistant manager. He was with Northern Canada Mines for six years.

Pho Thar, Burmese engineer, has been studying mining methods at the Kosaka, Akita Ken, Japan mine of Dowa Mining Company.

F. Dickinson has been appointed manager of the development and research department, Mond Nickel Company, England. He replaces Dr. L. B. Pfeil, who relinquished the position to devote his time to directorship responsibilities for the firm. G. Archer was elected managing director recently and L. K. Brindley named deputy chairman.

John Patton, Kennecott Copper Corporation, is now in Dutch Guiana where he is employed at one of the firm's gold properties. Formerly he was general surface foreman for Kennecott's Ray Mines Division, Ray, Arizona.

Keikki Tanner and Eero Turunen, Outokumpu Oy, Helsinki, Finland, have been making a tour of mining operations in the United States. They have been studying underground haulage mechanization and other mining problems in connection with their firm's copper mine in eastern Finland.

F. W. Denton, Jr., superintendent of the Oliver Iron Mining Company, Ironwood, Michigan, has been named general superintendent of the Philippine Iron Mines, Larap, Philippine Islands.

B. E. Woolstenholmes has been elected to the board of the Pena Copper Mines, Ltd., replacing P. H. Gimson. Pena has extensive copper properties in the Province of Huelva, Spain, and maintains offices in London, England.



J. A. PERHAM (left), managing director in Great Britain of the Atlas Diesel Company Limited, has been named sales manager for the Atlas world organization. He is succeeded as managing director of the British company by J. C. GREIG (right), formerly United Kingdom Manager of the stationary compressor division. Mr. Perham, who succeeds ERIK RYD, recently appointed technical director for Atlas Diesel, joined the Atlas firm of Canadian Copco Ltd. in 1949. As general sales manager, he was in charge of the team which successfully demonstrated the Atlas "Swedish method" of rock drilling on the Alcan ten-mile tunnel. After three years with the Canadian company, he was appointed managing director of the British firm. Mr. Perham's first assignment with Atlas was in Scotland where much of his work was concerned with supplying equipment for the various hydro-electric projects. Before taking over his present position, he spent several months in Sweden studying the design, installation, and operation of stationary compressors.

F. R. Beggs, general manager of Rye Park Scheelite and Uranium Corporation, Australia, made a recent trip to the United States. Also touring the United States from Australia is G. Hobart Duff of Hobart Duff Pty. Ltd., the Australian agents for Dorr-Oliver, Inc.

Sherwin F. Kelly, Wilmington, Delaware, has returned from a trip through the Caribbean and Central American in connection with the operations of his geophysical firm in the fields of mining and water exploration.

Marcos Mochulsky has resigned his position with the Industrial Bank of Argentina to join the Atomic Energy National Commission Research Laboratory in Buenos Aires.

Merle H. Guise, consulting mining engineer, is touring Australia and the Orient. His headquarters are in San Marino, California.

Andrew Farquhar has retired from the Tata Iron & Steel Company, Ltd., Calcutta, and is now living in Ayr, Scotland.

G. P. Contractor has left the National Metallurgical Laboratory, Jamshedpur, India. Deputy director is B. R. Nijhawan.

Paul Juul, division industrial engineer for Ray Mines Division, Kennecott Copper Corporation, Ray, Arizona, is now chief industrial engineer for Kennecott's Braden Copper Company in Sewell, Chile. Albert T. Shukas, formerly with Aerojet General Corporation in California, has replaced Mr. Juul at the Ray division.

J. B. Richardson, Royal School of Mines, London, England, is now in the Union of South Africa. His itinerary includes a series of lectures at the University of the Witwatersrand, Johannesburg.







*Note the stringers of Stoody 21 which act as "buffers" between abrasive earth and bucket sides. Inside surfaces of bucket receive similar protection.*

## All Buckets Take a Beating... Here's the Medicine!

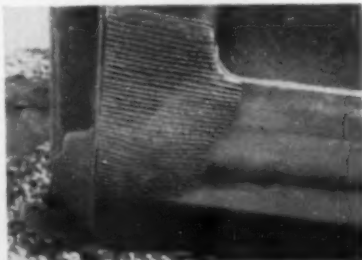
We're often asked about bucket maintenance, what hard-facing material to use and how to use it for maximum wear protection. Actually, your own equipment gives you part of the answer. Each bucket wears differently, depending upon how it is used and the kind of material handled. By watching for development of wear patterns, then hard-facing these areas at definite intervals, you'll get extended service with greatest economy. *Remember, a frequent touch-up is better than a major repair... more economical in hard-metal and less costly in down time.*

If buckets are severely worn, first build up with Stoody Manganese. For hard-facing, the alloy most commonly used is Stoody 21, preferred because of good wear resistance, fast deposition rate and low price. Occasionally, under conditions of excessive abrasion, Coated Tube Stoodite gives longer life on shovel teeth and reduces maintenance costs.

Full particulars on alloy recommendations and hard-facing procedures are in the Stoody **HARD-FACING GUIDEBOOK**. Ask your dealer for a copy (check the "yellow pages" of your phone book) or write direct.



*Bucket teeth (top illustration) and adapters (above) are amply coated with Stoody 21. Hard-faced teeth on this job averaged two full shifts of extra service before needing additional hard-facing treatment.*



*These Stoody 21 beads across the bucket resist severe abrasion as it is dragged across rubble, returning for a new bite.*



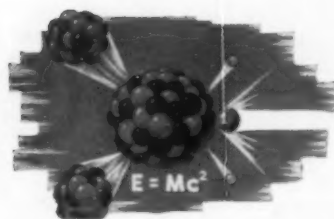
*Lips on this clam shell are kept in good shape for a tight seal with Stoody 21.*



*Scoop lifts often lead a tough life. Here, lips, sides and bottoms are kept in good condition with Stoody 21. Occasional touch-ups are made as wear occurs.*

**STOODY COMPANY** 11969 East Slauson Avenue, Whittier, California





# FISSION FACTS

Monthly Roundup of Mining News  
In the Atomic Energy Field

## Restricted AEC Data Made Available to Civilians

Under a new "access permit" program, the United States Atomic Energy Commission has approved a regulation granting access to "restricted," "confidential," and "secret" data relating to civilian uses of atomic energy. Data which is primarily of military significance is not included in the program, but technological information of civilian use may be made available to any person who can show a potential use or application of the information to his business, profession, or trade.

The classified data will only be made available upon application, for a limited period of time, and to persons showing a need for specific information having a significant effect upon their business.

Persons desiring "access permits" to restricted data on atomic energy technology may secure application forms and further details by writing to the Director, Division of Licensing, U. S. Atomic Energy Commission, Washington 25, D.C.

## More Requests of DMEA Aid For Uranium Projects Seen

Fifty-nine applications for exploration assistance in uranium projects were received by the Defense Minerals Exploration Administration during the first three months of this year. This represents a 50 percent increase over the number of applications received during the last quarter of 1954. The current uranium applications proposed projects with an aggregate estimated cost of \$5,320,000.

## AEC Opens Spokane Office To Meet Growing Activity

The U. S. Atomic Energy Commission has opened a district office in Spokane, Washington, and expanded its personnel in the area because of increased uranium activity in northeastern Washington and northern Idaho.

Head of the new district office is Hubert W. Norman, who early this year was assigned temporarily to Coeur d'Alene, Idaho, from the Butte suboffice of the Salt Lake exploration branch.

Prospectors have been staking claims and leasing land in many counties in the area. New uranium discoveries have been confirmed by government officials in Spokane County, Washington, and Boundary and Lemhi counties, Idaho.

The AEC has drilled a property in southwestern Stevens County and now is drilling a showing of high-grade autinite in Spokane County. The Stevens County mine (the Midnite on the Spokane Indian Reservation) is shipping from surface cuts and underground operations are underway by Dawn Uranium, Inc., a subsidiary of Newmont Mining Corporation. Phelps Dodge Corporation has greatly expanded its lease holdings in the area.

## New Beneficiation Process For Low-Grade Ores

Uranium ores containing from 0.05 to 0.20 percent  $U_3O_8$  not now marketable because of their low grade or distance from a mill or buying station may soon be profitably mined, according to Charles L. Love, president of Rocky Mountain Standard, Inc. Mr. Love is inventor of a new beneficiation process which has been tested at the Colorado School of Mines Research Foundation and has successfully raised the value of carnotite and autinite ores from the Colorado Plateau 10 to 30 times their original worth.

Contracts have been let for a 100-ton-per-day portable mill weighing approximately 80,000 pounds and mounted on

skids. Set-up time is estimated to be two days and knock-down time one day. The plant will be movable, using the same techniques developed in the oil industry in moving heavy field equipment.

After processing by the Love method, the ore is in a fine powder form ready for finish processing and concentrating by standard mills. In eliminating 90 percent of the ore's weight, considerable savings are anticipated in haulage. To date, carnotite ores from the Black Hills area have been beneficiated most successfully by the Love process, with one instance of ore containing 0.27 percent  $U_3O_8$  raised to almost 7.0 percent. Recovery rates on uranium in amenable ores have ranged from a low of 73 percent to a high of more than 90 percent.

## Uranium Mining Industry of Peru Stimulated By Well-Organized Atomic Energy Program

*Approximately 18 months ago, after considerable discussion with the United States Atomic Energy Commission, the Peruvian Congress passed an Atomic Energy bill which has greatly stimulated private uranium exploration in that country. As a result of this law the President of Peru established regulations for the control of radioactive substances and set up a special board to administer this program. As a service to its readers, especially those who are located within the ever-broadening sphere of the world-wide uranium industry, and as a summary of interest to uranium men everywhere, MINING WORLD is publishing this description of what one country has done to develop its uranium mining industry—Ed.*

On November 19, 1953 Peru opened the search for, and the development of, radioactive materials to all persons, national or foreign, by passing Congressional law No. 12004. This act made the State the exclusive buyer of radioactive minerals and modified existing portions of the Peruvian mining code which conflicted with this program.

A board of Control of Radioactive Substances of Peru, headed by Colonel Jorge Sarminento, was set up by the President on February 25, 1954, to govern radioactive substances. The Board is in charge of contracts, guaranteed price schedules, distribution of information among miners and prospectors, and negotiation of international contracts. Included on the Board are the following:

1. The Secretary, who posts a book of atomic energy accounts and keeps the archives.
2. The Office of Mineral Relations, which handles technical help and free counsel for miners and operators, distributes information, and keeps daily records on investigation activities.
3. The Office of Geology, which supervises geologists and engineers employed to make inspections of mineral workings, does assays, inspects installations and functions of laboratories, and

oversees technical trips of Peruvian technical men to foreign geological laboratories.

4. The Office of Buying Radioactive Minerals, which has in its charge the control of radioactive minerals and their purchase.

5. The Administrative Office, which handles funds for the board.

In Peru uranium ore containing a minimum assay of 0.5 percent  $U_3O_8$  is purchased by the board. Scale of purchase prices for uranium ore is determined yearly. The 1954 schedule, per metric dry ton, was as follows:

% $U_3O_8$ Content	Base Price	Bonus	Deduction	Net Value
0.50	\$38.50	\$13.75	\$15.00	\$37.25
0.75	57.75	20.62	15.00	63.37
1.00	77.00	27.50	15.00	89.50
1.50	115.50	41.25	15.00	141.75
2.00	154.00	55.00	15.00	194.00

A bonus equivalent to U. S. \$2.75 per kilogram  $U_3O_8$  is paid for the first 5,000 kilograms produced by each producer and delivered to the ore buying station (run by the Banco Minero del Peru) by November 30, 1960 as an incentive to initial production. Price for the ore is \$7.70 per kilogram of contained  $U_3O_8$ .

Uranium occurrences have been reported by the Board in the Vilcabamba region of southern Peru, where samples of ore assayed as high as 1.8 percent  $U_3O_8$  and in the Colquijirca mines, owned by the Fernandini interests. Samples tested at the Colquijirca mines assayed an average 2.46 percent  $U_3O_8$ , when tested by government and United States Atomic Energy Commission geologists. Last year the Peruvian Board of Control and the U. S. AEC signed an agreement governing the sale of uranium ores and concentrates to the United States. The agreement also provided for installations in Peru for the more efficient treatment of the ores, including concentration plants in low-grade ore areas.

# New!



50 mm dia. rubber block cyclones at left . . . double 30 mm dia. block at right.

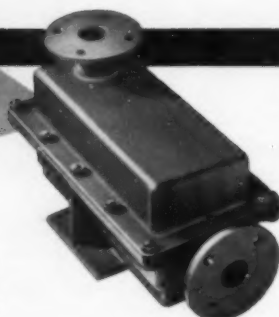
## Multiple Molded Rubber Block Cyclones Make Sharp Separations in 10 - 20 Micron Range . . .

Latest advance in wet cyclone design is the Type M DorrClone . . . developed for size separations in the 10 to 20 micron range. Designated as M-30 and M-50, this new design is now available with twenty 30 mm dia. rubber block cyclones or ten 50 mm cyclones in a common housing. Housings may be either cast stainless steel or bronze construction. When cover plate is bolted in place, each block is under compression to form a tight seal between feed, overflow and underflow chambers.

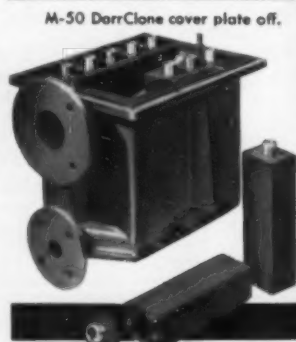
As with all cyclones, capacity and mesh of separation in the M DorrClone varies with the diameter of the individ-

ual units, operating pressure, feed solids concentration and specific gravity of the solids. On a slurry with a solids specific gravity of 2.7, the M-30 separates at 8-10 microns and the M-50 at 15-20 microns. As to capacity, the M-30 handles approximately 70 gpm at 20 psi, 100 gpm at 40 psi and 125 gpm at 60 psi. At these pressures the M-50 handles approximately 100 gpm, 140 gpm and 170 gpm. Top operating pressure for both is 125 psi.

For more information on this newest classification tool write for a copy of Bulletin No. 2504. Dorr-Oliver Inc., Stamford, Connecticut.



M-30 DorrClone completely assembled.



M-50 DorrClone cover plate off.

Lab units also available . . . for test units or very low flows. Fabricate stainless steel housing contains four 30 mm units or two 50 mm units. Separations are the same with equal diameter cyclones. Write for quotation.



# DORR-OLIVER

INCORPORATED

WORLD-WIDE RESEARCH • ENGINEERING • EQUIPMENT

STAMFORD • CONNECTICUT • U.S.A.

## Money Making Methods

(Continued from page 58)

interconnects the two tracks so that two cars can be loaded and hoisted alternately to speed up mucking.

The sinking cycle was one complete round per shift on a three-shift-per-day basis. Daily advance averaged 20 feet. A typical round was 48 eight-foot holes. This broke 230 cubic yards of clay, sandstone, and limestone which were



CLEANING-UP following a blast. The Traxcavator helped maintain a 20-foot per day advance in the incline shaft.



MUCKING out inclined shaft with a Caterpillar HT4 Traxcavator. Note how track is offset from center so loader can operate loaded into cars by one of two Caterpillars working alternate shifts.

The Frazier-Davis Construction Company of St. Louis, Missouri was shaft contractor with Howard Odell, project manager.

## Self-Luminous Sign Markers

A new self-luminous marker using strontium-90 as the radioactive phosphor has been developed by the United States Radium Corporation. The new marker should have wide spread use underground for directional, safety, and locational signs. The new markers have proved to have longer useful life, and greater brightness value over radium markers. Health hazards have also been greatly reduced. The strontium markers can be manufactured at present in all colors except red. These colored markers are already in widespread use by the United States Navy for self-luminous decks and personnel markers.

JULY 1955



## MULTIPLE HEARTH FURNACE



SIZES 8' 6" TO 22' 3" DIAMETER  
NUMBER OF HEARTHS, 1-16

### ROASTING CALCINING DRYING

ZINC ORES	QUICKSILVER
IRON ORES	MAGNESITE
COPPER ORES	LIMESTONE
TIN ORES	MOLYBDENUM
NICKEL ORES	BONE CHAR
LEAD ORES	DIATOMITE
SODA ASHES	LIME SLUDGE
FULLERS EARTH	MAGNESIUM
CARBON	CLAY GRANULES
PYRITE	ANTIMONY

SELENIUM

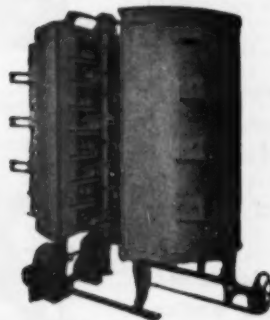
SEWAGE SLUDGE

LEAD CHEMICALS

METALLIC SLUDGES

FILTERING MEDIA

And for Numerous  
Other Materials



Pacific Laboratory Furnace

### PACIFIC LABORATORY FURNACE

Manufactured in two sizes—36" and 54" inside diameters having 6-8-10 Hearths and include the same features as the commercial size furnace.



Pacific Furnacing Unit

### NEW

### PACIFIC FURNACING UNIT

Higher shell height. Three gas burners. Provision for conversion to muffle unit. Small volume roasts at any desired temperature.

**PACIFIC FOUNDRY COMPANY LTD.**  
*Engineers and Metallurgists*

1400 So. Alameda St.  
Los Angeles

3100 19th St.  
San Francisco

551 Fifth Ave.  
New York

# More **AKINS** for the Iron Range

**3 - 66" AKINS DEWATERING CLASSIFIERS WITH  
1 - 78" AKINS SEPARATOR AND 2 - 48" AKINS DENSIFIERS  
FOR NEW IRON-ORE BENEFICIATION PLANT**

## **PROVED ADVANTAGES OF AKINS HEAVY-MEDIA SEPARATORY VESSEL**

Entire vessel is visible and accessible.

Variation in feed rate or grade of feed is not detrimental.

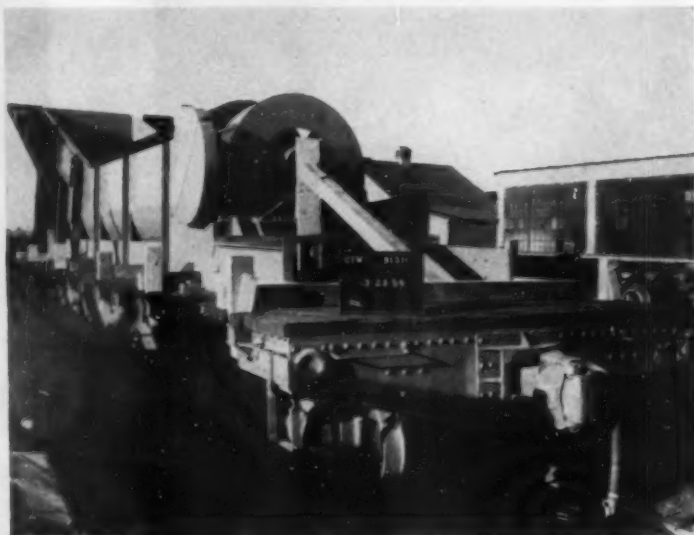
Large pool area and volume facilitates better recovery of values from fine sizes.

Circulation of media at lower gravity and viscosity.

Gradation of gravity and viscosity from feed entry point to sink removal point provides natural cleaning of sink.

No interference of product discharge.

Three product separation, when desired, in one machine from one medium cleanup circuit. Extraction of middlings results in improved grade of product.



*Akins—the ORIGINAL spiral type classifier.*

**COLORADO IRON WORKS CO.**

1624 - 17th Street • Denver 2, Colorado

**AKINS CLASSIFIERS AND HEAVY MEDIA SEPARATION EQUIPMENT  
SKINNER ROASTERS • LOWDEN DRYERS**

*Sole Agents and Licensed Manufacturers in Foreign Countries*

A SUBSIDIARY OF THE MINE & SMELTER SUPPLY CO.

[World Mining Section—48]

MINING WORLD





## INTERNATIONAL NEWS

### Government Signs Titanium Research Contracts; Four Firms Will Experiment with New Processes

Titanium research projects are gaining in number. The General Services Administration has signed a contract with National Research Corporation and the Monsanto Chemical Company for experiments with a new process for production of titanium metal, and another contract with Horizons, Inc. for a study of a new method of obtaining titanium from impure scrap; the Bureau of Mines has entered into a cooperative agreement with the Wah Chang Corporation to conduct research and development work on an improved process for the production of titanium sponge metal.

Under the National Research-Monsanto contract, a pilot plant having a rated capacity of 1,000 pounds per day will be used to test a new fused salt process. Previous work has reached a point where larger scale operations are necessary for a complete evaluation of the process. The government will reimburse the firms for the work which will cost about \$1,835,000, but the firm will not actually receive a fee for its work.

The contract also contains provisions for repayment of the government's investment should the process prove to be feasible and commercial production results within ten years.

The second agreement is with Horizons, Inc., of Cleveland, Ohio. The company will regenerate titanium from impure scrap metal by using its patented

process. Horizons, Inc., also will work without fee. Cost of the experimental operations is estimated at \$98,500, which the government will pay. However, should the work prove successful and the process be put into commercial production within ten years, the government will be reimbursed for its investment and will receive non-exclusive royalty free licenses on inventions and patents which may be developed.

Work on the Wah Chang project will be done at the Bureau of Mines' experiment station at Boulder City, Nevada, where part of the titanium pilot plant will be reactivated for the duration of the project. The primary objective is to conduct pilot plant tests and further improve a process for making high-quality titanium sponge metal that the corporation has developed on a small-scale in its laboratories at Glen Cove, New York.

Wah Chang will bear the major part of the expense of the project, and will detail technical representatives to work with Bureau engineers and metallurgists. The Bureau will publish the results of the tests, and any improved processes developed during the cooperative project will be made available to the industry.

The cooperative agreement was approved by J. J. Forbes, Director of the Bureau of Mines, on May 5, 1955, and will run for 12 months unless the work under it is completed sooner.

and calls for 100 tons of concentrate per day to be delivered to the subsidiary plant of Inco until the end of August and 125 tons per day thereafter until the end of January 1956.

The former contract, in effect while the Sherritt Gordon refinery at Fort Saskatchewan was under construction, included the United States government's General Services Administration as a third party. The GSA loaned Sherritt Gordon \$4,000,000 on a stockpile of concentrates estimated to contain 10,000,000 pounds of nickel built up during the months the Lynn Lake mines were in production ahead of the refinery. (See *MINING WORLD*, March 1955, page 65 for details of this earlier contract). With completion of the Fort Saskatchewan refinery it is expected that Sherritt Gordon's stockpile will be greatly reduced by the end of next January. The refinery is now treating concentrates at a rate of 18,000,000 pounds of nickel per year.

### Atlas Uranium Investment In Australian Firm Told

Atlas Corporation, New York City, has signed a contract to buy \$1,265,625 of the treasury stock of Northern Australia Uranium Company. The commitment, Atlas' first large-scale uranium investment outside of the United States, depends on a satisfactory examination of the Australian firm and its properties by Atlas representatives.

Northern Australia Uranium holds a prospecting lease on approximately 700 square miles in the Alligator River district in Northern Australia, near Darwin. Only a small portion of the area has been prospected. The Atlas purchase will provide funds for further development of the area, and it is expected that a mill will be built when development work is complete. The nearest mill at the present time is at Rum Jungle, 140 miles away.

Atlas, which is headed by financier Floyd B. Odium, to date has confined its uranium activities to the United States, except for minor interests in several Canadian operations. Last year the company purchased Vernon Pick's rich Delta mine in Utah for \$9,000,000, and is negotiating with the United States Atomic Energy Commission for permission to erect a mill near the mine, which is expected to produce 200 tons of ore per day when full capacity is reached.

### Major Changes Announced For Liberian Mining Code

The government of Liberia recently announced several major changes in the control of the domestic diamond mining industry and all internal and external diamond trade. Under the revised regulations supervision of exclusive mining claims remains under the jurisdiction of the mining board. Control over the mining, import, export, purchase, and sale of diamonds and other precious stones and metals now lies with the director of mines and geology.

All mining claims must be certified by the director. Concessionaires are limited to claims not in excess of 2,000 acres. Other prospectors and miners are limited to two claims of 100 acres each on a non-exclusive basis.

### Masara Nears Completion Of New Mill in Mindanao

Masara Mining Company is rushing completion of its 250-ton-per-day gold-copper-lead-zinc flotation-cyanide mill at Masara, Mindanao, Republic of the Philippines. This is the southernmost operation in the Philippines, and is operated by Samar Mining Company for the owners, Elzalde and Company.

Denver Equipment Company is supplying all new equipment for the mill and will send two engineers to the islands to start the mill and determine operating metallurgy. Masara is using a Symons cone crusher, Traylor gyratory crusher, and Traylor ball mill salvaged from its prewar Davao Gold Mining Company's 200-ton-per-day gold mill.

The mine is deep in the tropical rain forest. Vegetation is thick, wet, and ever growing. Prospectors found the vein outcrop in a creek bed. Masara has built a good road to the mine.

An unusual feature of the operation is a Peso 100,000 bridge now being built to connect the mine and mill so that ore from zero level can be trammed directly to mill head. This Wagus River bridge will be 200 feet long with a 110-foot center span 80 feet above the river. A war surplus Bailey bridge, double truss one atop the other, will be used.

Masara is also prospecting a copper deposit at Panuram, eight miles to the north. This is also north of the Goldsbrough claims where Panaminas did some development work. One area shows 60 feet of material assaying 2.36 percent copper. Dense jungle hinders prospecting but surface geology is complex with faults and leached zones. Diamond drilling is planned.

### Shaft To Serve Bird Reef To Be Sunk by West Rand

West Rand Consolidated Mines Ltd. will sink a rectangular, three-compartment shaft, the Monarch, to serve the western section of the Bird Reef horizons on its property in the Transvaal district of the Union of South Africa. The expansion of the West Rand reduction plant from 40,000 to 70,000 tons a month has created this need for more ore from an additional shaft.

Operations preliminary to actual sinking have been underway for some time, and actual sinking will start during the second half of this year. Estimated cost is £505,000.

The Bird Reef horizons have been and are being worked from extensions of the vertical and incline shaft systems which previously served the shallower Battery Reef horizon. On completion of the new shaft, the existing shaft systems are expected to be used again for their original purposes—namely, to serve the Battery Reef, either fully or partially. Ore from this horizon will again be mined and treated for its gold content, together with the Main, South, Kimberley, and Livingstone Reef ore.

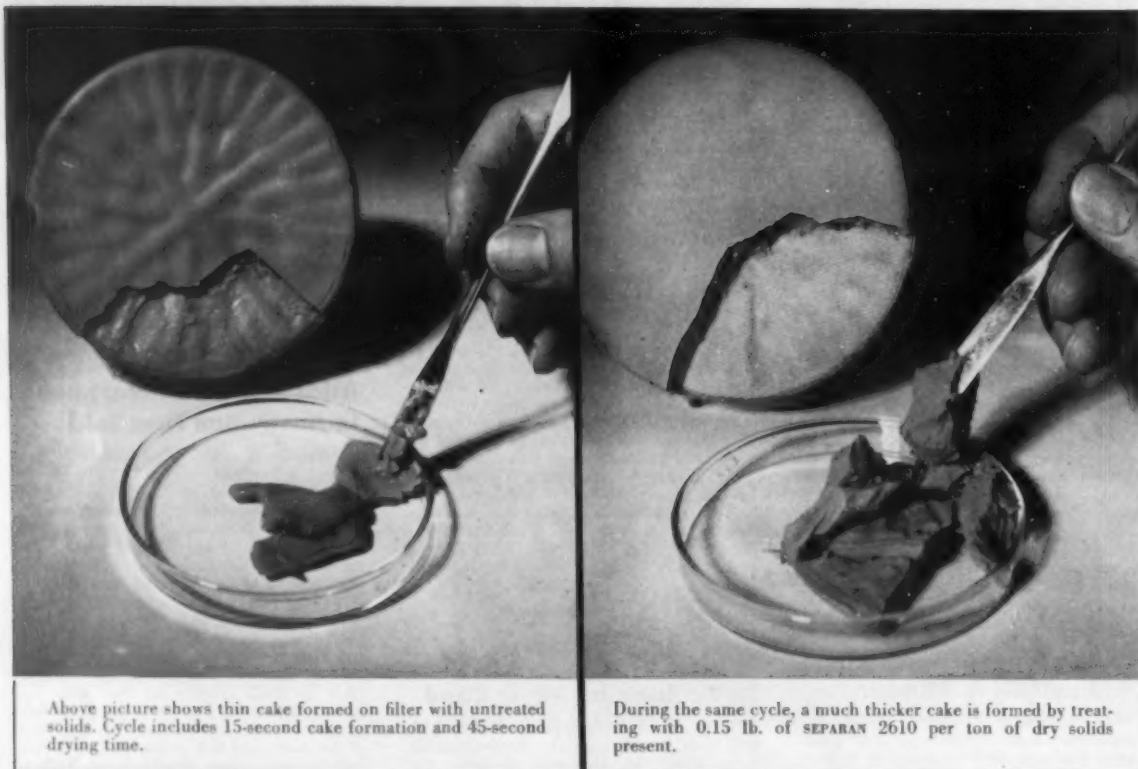
### INCO-Sherritt Gordon Sign New Nickel Agreement

International Nickel Company of Canada Ltd. has signed a contract with Sherritt Gordon Mines Ltd. for nickel concentrate shipments that will boost the total nickel output of the company to 25,500,000 pounds per month.

The nine-month agreement replaces the old contract which expired in April

# Separan 2610

## GREATLY IMPROVES FILTRATION



Above picture shows thin cake formed on filter with untreated solids. Cycle includes 15-second cake formation and 45-second drying time.

During the same cycle, a much thicker cake is formed by treating with 0.15 lb. of SEPARAN 2610 per ton of dry solids present.

New flocculating agent speeds up filtration and settling rates, brings many other improvements to liquid-solid separations

Prove to yourself the advantages of Separan® 2610 in filtration.

1. Increased cake size
2. Decreased cake moisture and better washability
3. Easy to handle and less dusty cake
4. Less material loss in filtrate
5. Effective over wide pH range

Prove to yourself the advantages of Separan 2610 in settling.

1. Up to 40 times faster settling rate
2. Increased overhead clarity
3. Less materials loss in overhead
4. Reduced cost in acid and alkaline media
5. Increased plant capacity

THE DOW CHEMICAL COMPANY  
Dept. TS 789D, Midland, Michigan

Please send me information and a trial sample of SEPARAN 2610.

Name

Company

Address

City  State

SEPARAN 2610 is highly effective in these industries:

- Uranium
- Clay
- Borax
- Cement
- Alum
- Potash
- Foundry Sand
- Coal
- Phosphoric Acid
- Iron Ore and Taconite
- Industrial Water, and Waste
- Miscellaneous Metals

\*Trademark of The Dow Chemical Company

you can depend on **DOW CHEMICALS**





## AFRICA

**UNION OF SOUTH AFRICA**—*Harmony Gold Mining Company* has completed installation of the second milling unit and thereby increased the reduction plant capacity from 45,000 to 90,000 tons a month. Trial milling in the second unit has been in progress for a short time. Test runs in the uranium plant were started toward the end of March.

**KENYA**—Exclusive rights to the monazite deposit at Mrima Hill, about 50 miles south of Mombasa (reported in *MINING WORLD*, June, page 72), are being offered by the Kenya government to any suitable mining company with the necessary large-scale capital. Several large companies from the United States, United Kingdom, and South Africa have already made preliminary inquiries. The deposit is said to contain about 30,000,000 tons of rare mineral ores—among them, pyrochlore and radioactive monazite containing thorium.

**FEDERATION OF RHODESIA AND NYASALAND**—*Magundi Chrome Mines Ltd.* has changed its name to *Magundi Copper Mines and Minerals Ltd.* in line with the extension of its activities to the exploration and development of new copper areas and other minerals in Northern and Southern Rhodesia, and South Africa. In these operations, the company is hopeful of securing the co-operation of certain undisclosed major interests. Rights over certain copper areas have already been obtained in Northern Rhodesia: namely, in the Mulengushi, Lusaka, and Mkushi districts. In addition, the firm has acquired a three-year prospecting agreement over five claims near Nachingwea, Southern Province, Tanganyika, in which copper and nickel values have been disclosed. The company, which has a permit to explore for prescribed (radioactive) material in South Africa, has acquired a concession over about 166,000 acres in the Lichtenburg district of the Transvaal.

**UNION OF SOUTH AFRICA**—*Stilfontein Gold Mining Company Ltd.* has started construction of the large new contact sulphuric acid plant. In the mine, development continues to advance ahead of current mill requirements, and the company is allocating the relevant expenditure to capital account in view of the projected increases in the milling capacity.

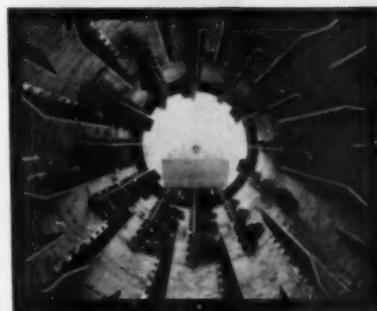
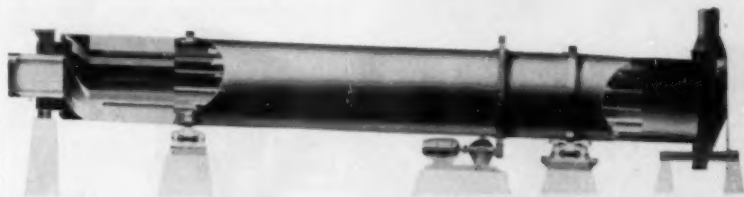
**TANGANYIKA**—Construction work on *Unwira Minerals Ltd.*'s new mill at Mpanda has been completed and the plant should now be in production. Regular output after shake-down problems are overcome will be at a minimum of 1,500 tons per month. Average content of one ton of ore is reported as—lead 48 percent, copper 10 percent, silver 45 ounces, gold 22 grams.

**GOLD COAST**—For some time, it was feared by officials of *Konongo Gold Mines Ltd.* that the Boabedroo ore body might be diminishing at depth in the same way as the Odumase Reef had done in the past. However, in the 15th level drive from the Odumase into the Boabedroo ore body, the final 110 feet finished during the March 1955 quarter were in pay values averaging 35.8 dwts. over a

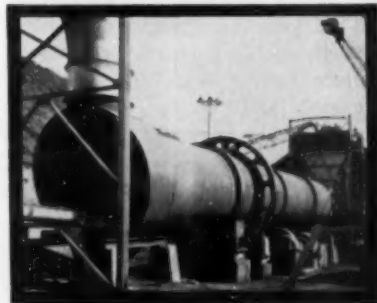
width of 48 inches, equivalent to 1,718 inch-dwts. This is the deepest development yet accomplished on this ore body. The Odumase 15th level is equivalent to the 14th level on the Boabedroo ore body.

**UNION OF SOUTH AFRICA**—Inadequate power supplies adversely affected the returns of *Rooiberg Minerals Development Company Ltd.* in the first quarter of 1955 when 181 long tons of concentrate were produced, compared with 194 in the final quarter of 1954. The "C" mine has now been connected to the Electricity Supply Commission system and the "A" mine will be connected soon.

**SOUTH WEST AFRICA**—*Kimberly (West) Diamond Corporation Ltd.* plans to investigate its two concessions in South West Africa, each of about 5,000 square miles. One includes the diamondiferous deposits at the mouth of the Kuene River in the north; the other is in or near the Grootfontein/Tsumeb district. The company has also recently been granted permission to investigate the radioactive potential of a deposit in the Eastern Transvaal, Union of South Africa. It is reported that 2,000 feet of the pyritic conglomerate have been developed, and that sampling has disclosed 7.33 dwt. per ton. An outcrop section of 1,400 feet disclosed 9.51 dwt. over 37



Interior of shell of "XH" Ruggles-Coles Dryer showing lifting flights and "knock-out" chains.



10' diameter, 80' long "XH" Ruggles-Coles Dryer drying bauxite.

from  
**A**lumina ores  
to  
**Z**ircon concentrates

... in the drying of ores and concentrates. That is the story of Ruggles-Coles "XH" Dryers.

Small or large, each dryer is designed for the specific requirements of the user with the knowledge and experience gained from hundreds of installations.

Complete specifications upon request. Ruggles-Coles Dryers are described in Bulletin AH-438-3

**HARDINGE**  
COMPANY, INCORPORATED

YORK, PENNSYLVANIA • 240 Arch St. • Main Office and Works  
New York • Toronto • Chicago • Hibbing • Houston • Salt Lake City • San Francisco



# GOOD RIDDANCE



To get rid of tailings, excess water and other wastes, you can always count on Naylor Spiralweld pipe. Here's the one lightweight pipe that's built for easier handling and installation without sacrifice of performance strength. And with the one-piece Naylor Wedge-Lock coupling, connections are easier and faster, too. Whether it's air or water—high or low pressure service—it will pay you to look into the advantages of this distinctive lockseamed, spiralweld pipe. Sizes from 4" to 30" in diameter. Thickness from 14 to 7 gauge. Write for Bulletin No. 507 on Naylor pipe and couplings.



1242 East 92nd Street, Chicago 19, Illinois

Eastern U. S. and Foreign Sales Office: 350 Madison Avenue, New York 17, New York

## INTERNATIONAL

inches. A pilot plant has nearly been completed.

**NIGERIA**—*Amalgamated Tin Mines of Nigeria, Ltd.* reports that mine output for the quarter ended March 31, 1955 totaled 1,187 tons of tin concentrates and 279 tons of columbite concentrates. For the year ended March 31, total production amounted to 4,416 tons of tin and 1,059 tons of columbite.

**EGYPT**—The National Bank of Egypt is reported to have agreed to advance up to £100,000,000 to the Egyptian government, £10,000,000 of which would be spent on construction of a steel plant.

**GOLD COAST**—The reports of the preparatory commission studying the Volta River Project are expected to be completed by the end of this year. The commission was appointed by the government of the Gold Coast and the United Kingdom to consider all aspects of an integrated aluminum development based on the water power of the Volta River. There is a potential capacity of 230,000 short tons of primary aluminum per year in the project, and it is being considered not only by the two governments, but also by the *British Aluminium Company, Ltd.* and *Aluminium, Ltd.*



**QUEENSLAND**—A new mineral has been discovered on the *Mary Kathleen* lease of *Australasian Oil Exploration N.L.* at Mt. Isa. This was found in the drill core from No. 1 hole. It is a boro-silicate of cerium and lanthanum, assaying approximately 64 percent cerium-lanthanum oxide, 22 percent silica, 12.6 percent boron trioxide, and 1.3 percent water. Research on the mineral is being carried out by the *South Australian Mines Department*; by Professor C.E. Tilley of Cambridge University, England; and by the *Commonwealth Scientific and Industrial Research Organization*.

**REPUBLIC OF THE PHILIPPINES**—Test work on the HMS pilot plant of *Lepanto Consolidated Mining Company* has been encouraging to date, and consideration is being given to installation of a unit with a capacity of as much as 2,000 tons per day to treat low-grade copper ore already developed in the foot-wall branch veins. The HMS sink product would then be ground and floated in the company's existing 1200-ton-per-day flotation plant. Much work must be done in the mine before mill expansion can be undertaken. The new low level drainage tunnel must be completed, the main shaft extended to the drainage level, mine ventilation improved, and additional mining equipment and transportation equipment purchased and installed. *Lepanto* is the largest and highest grade copper mine in the Orient. Its mill heads average nearly 4.0 percent Cu. The ore mineral is predominantly enargite.

**NEW SOUTH WALES**—*Wellington Alluvials Ltd.*, the only important gold producer remaining in New South Wales, is treating 300,000 cubic yards of sand per month for a recovery of up to 1,500 ounces gold per period. Costs are approximately 14 pence per yard. The dredge is working along the Macquarie River,



near Wellington. *Broken Hill Proprietary Company Ltd.*, Newcastle steel producer, is controlling shareholder. The latter has established a modern iron and steel research laboratory which will deal with problems associated with all phases of iron and steel production, from raw materials to finished products and their applications. Professor Howard Worner, former Professor of Metallurgy of the University of Melbourne, has accepted the position of director.

**INDONESIA**—The asphalt rock mine on the island of Buton, south of Celebes, which was nationalized in October 1954, produced 640 tons in November and December. Between 1934 and 1938, the average yearly output was 1,800 tons of asphalt. It is expected that after modernization is completed in 1957, a daily output of 200 tons will be forthcoming. The ore is asphalt impregnated limestone. Before the Department of Roads of the Ministry of Public Works took over the operation, it was run by a Dutch company—N.V. *Mijnbouwmaatschappij Buton*.

**REPUBLIC OF THE PHILIPPINES**—*Philippine Iron Mines Inc.* is pushing drift development of its uranium-copper-molybdenum deposits at Larap, Camarines Norte. Discovery of this uranium zone was first reported in *MINING WORLD*. Drilling has shown that a calcareous bed in meta sediments appears to be the ore host rock. A series of these beds, dipping at 40° and badly faulted, will be prospected in depth. Proposals for a 300-foot winze have been made to management. Three levels will be turned and the extent and grade of mineralization determined by drifting along the favorable beds.

**QUEENSLAND**—A company is being formed in Melbourne, Victoria, to mine for cobalt in Queensland. A considerable amount of this element was mined in the Cloncurry district between 1920 and the early 1930's, especially at the *Mount Cobalt* mine near Selwyn. This mine produced nearly 1,500,000 pounds of cobalt between 1922 and 1925. Production was greatly restricted after 1924 by water shortage and very little work has been done in recent years. There are several smaller mines also in the Selwyn area.

**REPUBLIC OF THE PHILIPPINES**—Iron and copper exploration is underway by *Samar Mining Company* in the Baguay area nearly in the geographical center of Samar. There is surface evidence of important iron reserves. Diamond drilling has been recommended. Underlying the iron formation is a carbonaceous shale which shows appreciable copper values where it outcrops over a 50-meter length.

**INDONESIA**—The *Bengkalis* gold placer deposit in central eastern Sumatra is being mined with a prewar dredge which has been repaired. Production started in October 1954 and has averaged about 6 kilograms of gold monthly with a content of 95 to 98 percent Au. They are first working old Japanese tailings. Before the war production was about 1 kilogram daily. The only gold-silver smelter in Indonesia is that of the *Guthwirth Trading Company* at Djakarta.

**NORTHERN TERRITORY**—*Rio Tinto Ltd.* is about to begin drilling for uranium only 40 miles from Darwin, near Manton Dam, where the firm holds 200 square miles under prospecting authority. R. Mathieson, Rio Tinto's Northern Territory manager, states that the area may be a continuation of the

uranium beds found by Donald Dyson and himself at Rum Jungle four years ago. The Manton Dam area is said to resemble the Algonia uranium field in Canada which Rio Tinto recently purchased for £28,000,000. In the area now being examined, surface mineralization is of low-grade but nevertheless profitable if there are sufficient deposits to mine in quantity.

**REPUBLIC OF THE PHILIPPINES**—*Suriago Consolidated Mining Company* has started exploration work on the property of *Raon Lobo Industrial Corporation* in Batangas. Suriago has an agreement with the *Pan Philippines Corporation* to develop the property on a profit-sharing basis after a nine-month exploration period. Pan Philippines previously discovered copper-barite ore deposits at that location.

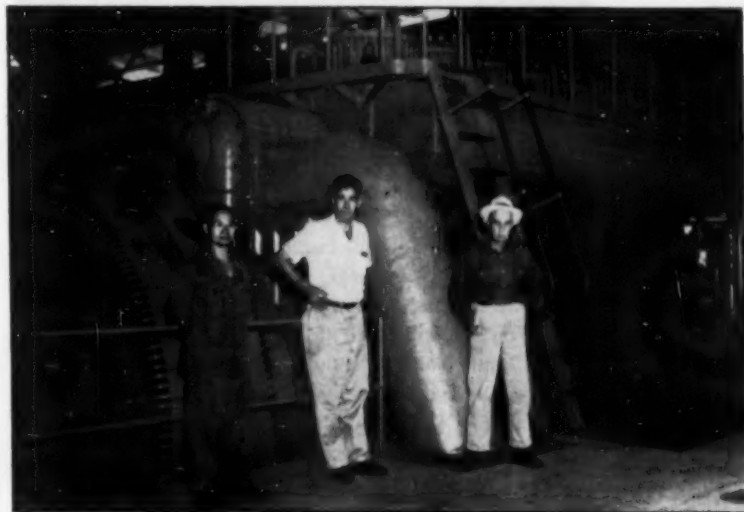
**NORTHERN TERRITORY**—Excellent returns continue to be made by *Australian Development N.L.* from its *Nobles Nob* mine at Tennant Creek. During the last month, 4,200 tons of ore have been treated for 7,250 ounces of gold. Recent developments indicate that these values will continue for some time. *Peko (Tennant Creek) Gold Mines N.L.*, a gold property which turned into a high-grade copper deposit, is also showing good returns. Concentrates amounting to 500 to 600 tons per month of about 25 percent copper have been produced and shipped to Japan.

**WESTERN AUSTRALIA**—*Shaw River Alluvials N.L.* at Marble Bar is having

difficulties in implementing its production program. Earth-moving equipment has been obtained but new power units are required. A hydrological survey of the water resources in the Rhodes and Shaw River areas has been completed, and it is estimated that 2,000 cubic yards can be wet-treated per day. Samples have been forwarded to Germany for testing by dry methods and, if successful, larger daily tonnages will be concentrated. Small amounts of cassiterite concentrates have been sent to Sydney for smelting.



**MALAYA**—The *Malayan Minerals Company Ltd.* has made its first shipments of iron ore to Japan, and expects to be shipping at a rate of 40,000 tons monthly soon. The company has a contract with the *Yawata Iron and Steel Company* and the *Kawasaki Steel Corporation* to supply them with iron ore from the mine at Johore. The company has a 21-year lease on this old *Sri Medan mine*, formerly operated by *Ishihara Sangyo Koshi Ltd.* The mine is located about 10 miles from Batu Pahat, and covers about five acres. Before the war, only hand labor was used, but nearly \$1,000,000 has been spent in mechanizing operations.

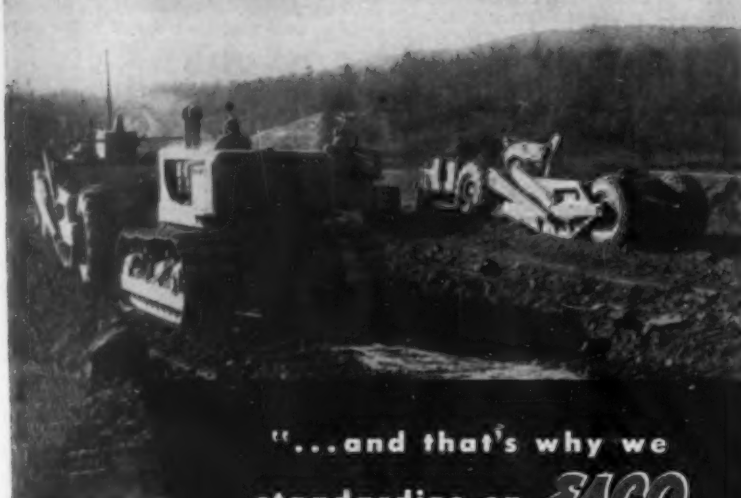


## Benguet Installs Huge Power Plant Engine

Pictured above is the new 1,800-horsepower Nordberg Diesel electric engine completed at the Benguet Consolidated Mining Company's power plant at the Balatac gold mine in Mountain Province, Republic of the Philippines. This is the largest piece of equipment ever installed in the Baguio district gold mines. The main frame casting weighed 40 tons. Transportation of such heavy equipment into the area was impossible before World War II because of limitations on bridges. However, the Army during the liberation of the Philippines strengthened the bridges finally making it possible to bring this casting in. Needless-to-say, the efficiency of electric generation has been increased. With this additional source of electric power, it will now be possible for Benguet to resume deep-level exploration and mining through the Judge shaft. The shaft was sunk before the war but has never been completely dewatered since that time; also, while the shaft is down, the vein system has not been crosscut from the bottom. The extra power was needed to assure adequate pumping capacity for the main haulage level from which the water flows by gravity to the surface. In the photo, the man at left is unidentified. In the center is G. Nordstrom, machine shop superintendent and Diesel plant superintendent; at right is G. Ritter, electrical superintendent.

## "We Doubled Blade Life ...stopped Blade Breakage"

—said C. F. Hewitt, President, Hewitt Contracting Company  
Columbus, Ohio



"...and that's why we  
standardize on **ESCO**  
Alloy 12M Scraper Blades"

"Rolled steel blades were giving us a rough time," said Clyde Hewitt, President, Hewitt Contracting Co. "They were wearing out fast and costing us plenty in breakage downtime. When we switched to ESCO Cast 12 M Blades, on one job, blade life more than doubled and blade breakage stopped entirely. Can you blame us for standardizing on ESCO Blades?" ESCO Blades last longer because they are cast of ESCO 12M—a special alloy steel metallurgically-engineered by ESCO to resist the impact and abrasion of scraper operation. See your ESCO Dealer or write for cost-reducing details.

FOR LONGER  
BLADE LIFE  
ALWAYS  
ASK FOR...

# ESCO

**ESCROW TOOL FOUNDRY COMPANY**  
Manufacturing Plants: Other Offices and Warehouses:  
2147 N. W. 23th Ave., Los Angeles, California, Pa.  
Portland 10, Oregon, San Francisco, Calif., Houston, Texas  
512 Foster St., Seattle, Wash., Eugene, Ore.  
Denville, N.J., Wichita, Kan.,  
ESCO International—New York Office: In Canada,  
at 420 Lee Avenue East, New York City, Vancouver, B.C.,  
at Portland Manufacturing Plant, Japan, Osaka

## INTERNATIONAL

**INDIA**—The initial capacity of the proposed Rourkela steel plant in Orissa State is being increased from 500,000 to 1,000,000 tons and a supplementary agreement is already being negotiated with the German Krupp-Demag combine. The original plan had been to increase capacity after initial operation on the basis of 500,000 tons.

**KOREA**—Intensive prospecting by United States and Korean geologists in the Kum-Wha district of Kankwon Province has indicated high radioactivity in the area. Samples are being sent to the ROK Army Science Laboratory at Loryang Jim and to the UNKRA Mineral Laboratory at Taechon. Complete assay results may not be announced for some time, but it is believed that the ore averages about 0.3 percent U<sub>3</sub>O<sub>8</sub>.

**TURKEY**—A recent agreement with the British Imperial Chemical Industries group in London provides for sale of 3,000 tons of Turkish blister copper. Deliveries are to be made during the second half of this year, with the price to be based on the average London Metal Exchange level over an agreed period.

**MALAYA**—Larut Tin Fields Ltd. reports a production increase of tin concentrate in 1954. Output from the company's two dredges was 939.49 tons as compared with 684.29 tons in the previous year ended September 1953. The improvement was brought about by better operating performance and a higher average yield of tin ore per cubic yard treated. Also the company was able to treat middling dumps, accumulated in past years, by means of a high tension separating plant installed for this purpose. It was able to recover approximately 270 tons of high-grade tin concentrates suitable for shipment. These dumps have now been worked out and the plant will be used for current production requiring this treatment so that the extra production of last year will not recur.

**BURMA**—It is reported that the Maw-chi mines, in rebel hands since the war, are now being reopened and will be in production by November. Before the war, these mines normally produced about 10 percent of the world's wolframite.

**INDIA**—A new 500-ton plant has been installed in one of the Panna diamond mines in Vindhya Pradesh. Employing 3,000 workers, the Panna Mines constitute the largest diamond producing center in India. Owned by three I-stees, the mines produced 2,807 diamonds valued at Rupees 4 lakhs during 1954. When fully developed and equipped with modern technical devices, they are expected to produce 2,000 carats of diamond daily valued at Rupees 12 crores per year.

**TURKEY**—With market conditions improving, several new manganese mines are being opened on the eastern coast of the Black Sea.

**MALAYA**—Hongkong Tin Ltd. carried out experimental operations with a grab dredger last year on certain areas which had previously been dredged but where virgin ground lies below the maximum digging depth of the bucket dredge. These experiments were undertaken jointly with other mining companies (among them, Grab Dredger (Experimental) Syndicate) in view of the fact that similar problems exist in other parts of the Malayan tin fields. At present the dredge is operating in ground previously

worked during the Japanese occupation. This area lies between the position of the dredge when it started work, and the selected ground of previously dredged areas. According to recent estimates, values of tin ore on the property should provide profitable extraction for about eight years.

**INDIA**—A deposit of beryl ore has been discovered in the Srikakulam district in the southeastern state of Andhra. Survey work is now in progress to determine whether there are other deposits in the area. Beryl is one of the minerals protected under the Atomic Energy Act of India.

**TURKEY**—Borax Consolidated Ltd. of England is reported to be investing £100,000 in a boracite mine in Turkey. The money is being used to modernize and enlarge the existing facilities.

**MALAYA**—Killinghall Tin Ltd.'s dredge continues to operate in ground of variable tin ore content, but test boring in the remaining area within the present subleases indicates sporadic occurrences of payable values below the present digging depth. Investigations concerning the best economical way of getting to the deeper alluvials are now being carried out and this may lead to certain modifications of the dredge. During the latter part of last year, the company started to bore to the west of the present dredging course and also in the Estate which lies to the north of the company's mining lease. Initial results indicate that there is a possibility of finding sufficient ore to make economic extraction a possibility. During the last three months of 1954 and the first three of 1955 a total of 233 tons were produced.

**KOREA**—A recent claim for concession rights filed at the Ministry of Commerce and Industry has revealed the existence of uranium deposits in Chonan district of South Chongchong province, about 40 miles south of Seoul. A Geiger counter revealed radioactivity and samples taken by the Mining Bureau were sent to the UNKRA Laboratory and the United States Atomic Energy Commission.

**JAPAN**—Koyoto University plans to send an 11-member scientific team on a seven-month expedition through the little known Karakoram region where Pakistan meets Russia, Bharat (India), and Afghanistan. Purpose of the expedition is to study the geology, plant life, and civilization of this area, which lies beyond the Khyber Pass cradled between the Karakoram and Hindu-Kush mountain ranges. Dr. Jitshi Klhara of the University's science faculty will lead the group.



**CUBA**—Inter American Industries, Inc., a Delaware firm, has acquired a 24-year lease on 7,335 acres of property in Oriente Province where it is now drilling for manganese. Thirty-six of the 40 claims are in the Cambute area, and the remaining four are in the El Iris mining section.

**BRITISH GUIANA** — North-West Guiana Mining Company, Ltd., with headquarters in the United Kingdom, has been granted a 30-year lease to explore

and develop a possible manganese property. The company is expected to start production by 1958, with about \$20,000,000 spent in installation and exploration work by that time.

**MEXICO**—Large shipments of Mexican-mined sulphur have been made recently to France and Israel. Both shipments were made through the port of Vera Cruz, with 5,000 tons destined for France and 4,000 tons for Israel. The port expects to export between 40,000 and 50,000 tons of sulphur to France, Great Britain, and Belgium before the end of summer.

**BRAZIL**—The Brazilian Department of Mineral Production has been studying the monazite sand deposits of the Brazilian coast intensively, and has classified the deposits into three location groups: north of Vitoria; the region between Vitoria and Barra de Itabapoana; and south of Barra de Itabapoana. A modern laboratory for the principal physical and chemical analyses is maintained by the Department in Vitoria. At present, the monazite produced in these areas is being sent to Sao Paulo where it is treated for production of thorium compounds. All operations are supervised by the government.

**BOLIVIA**—Representatives of the *Brasert Company* in the United States are reported to have negotiated an agreement with the Bolivian government allowing the U.S. firm to explore the *Mutum* mineral deposits in the Department of Santa Cruz iron ore is supposed to be the principal mineral in the deposits.

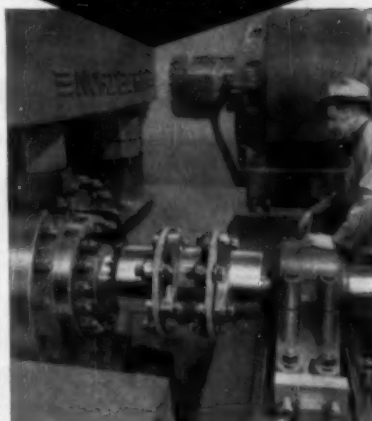
**ECUADOR**—Minas Nacionales S.A. has been granted a 30-year concession to explore and to mine a zone covering 20,000 hectares in the provinces of Guayas and Manabí. The contract includes exclusive rights to establish exploration operations, using machinery, instruments, and laboratory facilities considered necessary in an air and ground search for titanium and other minerals. The contract excludes the right to explore and develop any radioactive minerals, however. The firm has four years in which to begin exploration work.

**COLOMBIA**—For the first quarter of this year, ended March 31, *Amazon Gold Dredging, Ltd.* dredged 265,000 cubic yards to recover 2,223 ounces of fine gold, as compared with 1,187,400 yards dredged in the same period of last year to recover 3,406 ounces. The company anticipates that the No. 1 dredge will have exhausted its gravel reserves of 1,549,000 cubic yards by the ends of 1955 or early 1956, and during that period the management will continue to make sales of equipment and supplies as are not required for the one dredge operation.

**BRAZIL**—A large deposit of bauxite has been discovered in the territory of Amapa, bordering French Guiana, in the northern part of Brazil. The mineral found is considered to be superior quality, with a mineral content of over 69 percent.

**BOLIVIA**—Representatives of *Mauricio Hochschild (S.A.M.I.)* and *Aramayo de Mines en Bolívia* are protesting the failure of the Bolivian government to carry out its obligation for provisional retention payments against compensation for mining properties confiscated several years ago. These two companies charge that the government is attempting to

**Specify THOMAS** ALL METAL  
**FLEXIBLE COUPLINGS**  
for Power Transmission to  
avoid Costly Shut-Downs



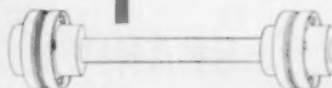
For regular industrial applications  
as well as those extra tough jobs  
in heavy industry.



Patented Flexible Disc Rings of special  
steel transmit the power and provide  
for parallel and angular misalignment  
as well as free end float.

#### DISTINCTIVE ADVANTAGES

FACTS	EXPLANATION
NO MAINTENANCE	Requires No Attention, Visual Inspection While Operating.
NO LUBRICATION	No Wearing Parts, Freedom from Shut-downs.
NO BACKLASH	No Loose Parts, All Parts Solidly Bolted.
CAN NOT "CREATE" THRUST	Free End Float under Load and Misalignment, No Rubbing Action to cause Axial Movement.
PERMANENT TORSIONAL CHARACTERISTICS	Drives Like a Solid Coupling, Elastic Constant Does Not Change, Original Balance is Maintained.



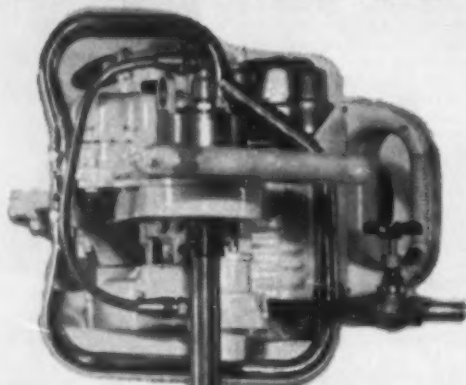
Thomas Couplings are made for a wide range of speeds, horsepower, shaft sizes and can be assembled or disassembled without disturbing the connected machines, except in rare instances.

Write for new Engineering Catalog No. 51A

**THOMAS FLEXIBLE COUPLING CO.**  
WARREN, PENNSYLVANIA, U.S.A.



**PROSPECTORS—MINERS—CONTRACTORS**  
**? 44½ LBS! ?**  
**INCLUDING BUILT-IN WATER PUMP**  
**PORTO-DIAMOND DRILL**  
**CONSTRUCTED FOR USE WITH WATER OR AIR**



**CUSTOM  
MADE  
FAMOUS  
McCULLOCH  
6 H.P. or 9 H.P.  
MOTOR  
LIGHTWEIGHT**

An easy one-man load for difficult terrain. Model 630A with 6 H.P. motor and built-in centrifugal never-miss water pump. Weighs 44½ lbs. Model 999 with 9 H.P. motor and built-in water pump weighs 51 lbs. Porto-Diamond drill eliminates 42 lbs. with built-in pump.

**A ONE-MAN  
RIG THAT  
DRILLS  
DOWN  
TO  
375 FEET  
Simple to Operate**

Mechanical construction permits easy maintenance and repair in the field by untrained personnel, using no special tools. McCulloch repair shops everywhere. Can be jeep mounted where such vehicles are practicable.

**DRILLS A 1-1/16" HOLE AND RECOVERS A 3/8" CORE**

**URANIUM ENTERPRISES**

**DEALER INQUIRIES INVITED**

**Write for Details**

**"World's Largest Airborne Prospectors"**

**MFGS. OF PORTO-DIAMOND DRILLS — GEIGER &  
SCINTILLATION COUNTERS**

**FIDELITY BUILDING**

**MADison 8739-9695**

**SPOKANE 1, WASHINGTON**

**INTERNATIONAL**

force them to accept a reduction of 1 percent on retentions payable on non-tin ores produced in their nationalized mines. They also say they were not granted the half-percent increased retention on tin ores recently given to *Patino Mines and Enterprises Consolidated* and that this violates the pledge of the government that all three firms would get equal treatment. The mine representatives deplore the lack of progress in fixing final evaluation of the confiscated properties and claim that the two-year-old retention agreement was only to be a stop gap measure.

**BRAZIL**—*Companhia Siderurgica Belgo-Mineira* will build a steel fabrication plant with an initial monthly capacity of 7,500 tons. Plans call for eventually increasing this to 15,000 tons.

**ECUADOR**—*Ecuadorian Mining Corporation* is reported to be considering an expansion program for its *Tixan* sulphur mine where production is currently at the rate of about 4,000 tons per year. Domestic and export shipments will take the entire output for the next six months. Rumors about the plant and mine reverting to the government are said to be without foundation.

**MEXICO**—The iron and steel plant being erected by *Cia. Fierro y Acero de Bajo California, S.A.* at Ensenada, Bajo California, is expected to go into operation about August 15. The eight ovens are now being installed. Total cost of the project is estimated at about \$5,600,000.

**COLOMBIA**—For the first three months of 1955, *Pato Consolidated Gold Dredging Ltd.* dredged 7,286,500 cubic yards for a recovery of 45,160 ounces of fine gold. During the same period of 1954, the company dredged 6,287,100 cubic yards to recover 49,517 ounces. As was anticipated, the centralization of camps and shops at Bagre was instrumental to a degree in the reduction of working costs from 13.17 cents to 11.43 cents per cubic yard.

**MEXICO**—*Impulsora de Minera de Angangueo*, the mining cooperative that took over the *La Dolores* mine after the *American Smelting and Refining Company* discontinued operations because of fire and explosion, is already experiencing a stockpiling problem. Nearly 2,000 tons of ore are stalled at Angangueo because of a lack of sufficient box cars to carry it to the refineries in various parts of the country. The firm has told the National Railways that unless the situation is promptly corrected, the company will have to suspend operations to avoid aggravated stockpiling.



**NORWAY**—Norway's first large steel plant, at Mo i Rana, a few miles from the Arctic Circle, is now in production. Output will be approximately 170,000 tons of rolled steel products per year, to be increased later to about 230,000 tons. Pig iron capacity is now 180,000 tons per year. This figure will be raised to 240,000 tons with the installation of a fourth electric furnace. Iron concentrates are now coming from the *Sydvaranger* mines at Kirkenes and from the *Fosdalen*



mines near Trondheim. Later, it is planned to use the large deposits of low-grade iron ore in the nearby Dunderland Valley. The steel plant is operated by A/S *Norsk Jernverk* and was built by the government at a cost of £27,000,000.

**POLAND**—A deposit, reportedly containing 99.7 percent pyrite, has been found approximately 3,500 feet above sea level in the Iser Mountains near Szklarska Poreba. The Polish mining industry hopes to be able to produce enough pyrite from this region to eliminate the need for imports. A production quota of 25,000 metric tons has been decreed for the current year.

**WEST GERMANY**—The beginning of titanium metal production has been reported from Germany. *Krupps* exhibited titanium-made products at the recent Hanover Fair. The titanium sponge was supplied by a German subsidiary of the United States firm, *National Lead Company*.

**RUMANIA**—Uranium ore deposits are now being mined in Rumania under Soviet direction. Mining operations are being conducted by the "Sovromquartz" company, one of the two Soviet-Rumanian companies which was not returned to Rumanian control last year. The most important uranium deposits are said to be in the lead mining region of Baia Mare, near Capnic. Thorium and uranium have also been found at Beica, in the Banat region, and near Oradea, in western Transylvania. Production at a uranium mine near Turnu Severin began at the end of 1954.

**ITALY**—*Stabilimento Minerario del Sile*, Italy's second largest mercury producer, reported a net profit of 600,000,000 lire in 1954. Net profit for 1953 was 412,000,000 lire. Properties of the firm are located in Tuscany.

**WEST GERMANY**—The *Ruhrstahl* steel works is reportedly planning to send experts to the Republic of the Philippines to investigate iron and nickel deposits on Mindanao Island.

**CYPRUS**—31,700 tons of ore were shipped by the *Cyprus Sulphur and Copper Company* for the year ended March 31. The firm is continuing its drilling program at Evloimeni where a zone of low-grade mineralization was reported.

**SWEDEN**—Production of pig iron during the first three months of 1955 amounted to 311,200 tons. Sponge iron production reached 13,200 tons. These figures compare with figures for the first quarter of 1954 of 250,600 tons and 14,300 tons, respectively. Swedish exports of iron ore in the first quarter of 1955 was 2,930,000 tons, compared with 2,608,000 tons in the same period last year.

**WEST GERMANY**—The *Rochling Steel Works*, Volklingen, Saar Basin, has been sold to the German and French governments for what is believed to be in excess of 200,000,000 Swiss francs. Disposal of the plant to private interests will be handled through a consortium headed by the German banking house of *Abt*. Output of the *Rochling* works last year was 880,000 tons of crude steel.

**FRANCE**—Iron ore production for the first quarter of 1955 reached 12,820,900 tons compared with 10,820,900 tons for the first three months of 1954. Exports reached 3,241,000 for the three-month period in 1955, with *Belgo-Luxembourg Economic Union* as the biggest foreign buyer with 2,950,400 tons.

**POLAND**—New iron ore deposits have been discovered near Litzmannstadt with Fe content reported at more than 35.0 percent. Near Wreczyzna, in the Stalino-grod district, work is progressing on a new iron mine which is to be equipped with Soviet machinery and tools.

**YUGOSLAVIA**—At the *Kaydanpek* iron ore open-pit mine, a daily production level of 10,000 metric tons has been ordered. Nine percent Cu is being mined at the operation.

**FINLAND**—Representatives of the Finnish government and the State-owned *Otanmaeki* mines have been negotiating with British officials in London concerning sale to the United Kingdom of an undisclosed quantity of ilmenite. The titanium bearing ore is found on Finland's "waist line" in glaciated country south of Lake Oulu.

**USSR**—Steel production for 1954 in the Soviet Union has been reported at 41,000,000 metric tons.

**CZECHOSLOVAKIA**—The *Kuncice "Gottwald"* steel works have been put into production. Annual capacity is set at 1,000,000 metric tons.

**AUSTRIA**—The country's two aluminum mills are expected to exceed the 50,000 metric ton production level in 1955. Output of primary aluminum during 1954 was 48,008 tons.

**YUGOSLAVIA**—Production targets for 1955 have been announced by the Belgrade government. They include: iron ore 237,000 metric tons; raw steel, 380,000 metric tons; zinc material (rolled), 12,000 tons, and aluminum rolled goods, 16,000 tons. All of the above figures represent increases over 1954's production level.

**SPAIN**—Extensive development work is being carried out by the *Tharsis Sulphur & Copper Company, Ltd.* at the

*North Lode* mine and other operations at Tharsis and Calanas. An increased demand for pyrites during 1954 resulted in shipments of 718,983 tons, compared with 606,699 tons in 1953.

**WALES**—*British Metal Corporation Ltd.* and landowners in the Amlwch area have reached an agreement to begin reworking the copper mines near Parys Mountain, which were operated during Roman times. Surveying work is scheduled to begin immediately. Lead and silver have also been mined at Amlwch, and Parys Mountain is believed to contain 69 different minerals.

**CYPRUS**—The first 5,000 tons of pyrites from the new Limal mill of *Esperanza Copper and Sulphur Company, Ltd.* have been sold. Gravity, regrinding and flotation sections at the mill are now operating smoothly, and an additional flotation unit is now being built. Operations are also proceeding satisfactorily at the *Kinoussa* mine and treatment plant.

**SPAIN**—Directors of *Pena Copper Mines* have accepted an offer for their properties and stocks in Spain. The transaction will leave the firm without mining operations, but the company plans to stay in business as a metal agent.

**ENGLAND**—Uranium deposits have been discovered in southwest England with a  $U_3O_8$  content reported at 0.73 percent. No plant to treat the ore is contemplated, since the small quantity does not warrant it.

**NORWAY**—*Elektrokemisk A/S* and the Swiss firm of *Aluminum Industrie Aktien Gesellschaft* have set up a partnership to build an aluminum factory in Mosjoen, northern Norway. The factory initially will produce 20,000 tons of aluminum with capacity eventually increased to 60,000 to 80,000 tons annually. Production is set for 1958.



## Crew Breaks British-European Tunneling Record

The latest British-European tunneling record has been set by the crew of *Marples Ridgway and Partners, Ltd.*, (shown above) engaged in construction of the North of Scotland Hydro-Electric Board's *Allt-na-Lairige* Project. The previous record was set in the St. Fillan's section of the Board's *Breadalbane* Project where *Mitchell Construction Company* crews drove 428 feet in one week (See *Mining World*, March 1955, page 67.) Working 12-hour shifts, a 9-man team of *Marples Ridgway* advanced the face a distance of 444 feet through granite in the 8-foot by 6-foot 6-inch tunnel during a seven-day period starting March 31. An exceptionally short working cycle was achieved by close attention to drilling speed, gas clearance, and to loading out the broken rock. Holman drilling equipment, comprising *Silver 3* rockdrills mounted on air-legs and using tungsten-carbide tipped *Halsteels*, was used throughout the 6,000 feet driven to date. Three machines, drilling a 21-hole pattern 8 feet deep, were used at the face. At the start of the record-breaking period, these machines, with three standbys, had already drilled a total of 150,000 feet in this tunnel.

## URANIUM and OIL

# PROSPECTING

GEIGER and SCINTILLATION COUNTERS  
for EVERY PROSPECTING APPLICATION

### AIRCRAFT



For the quickest, proven method of prospecting — from aircraft . . . The RADIAC Company recommends the up-to-the-minute "CARDINAL"—\$2420.00

### VEHICULAR

For prospecting from a moving vehicle — the "NUCLEOMETER"—\$545.00



### DEEP DRILL HOLE

For accurate gamma ray measurements in drill holes down to 4000 feet for Oil or Uranium—the Super Sensitive "SCINTILLOGGER"—\$2350.00

### ON FOOT

Probably the most dependable Geiger Counter you can buy at any price for on-foot prospecting — Model DG-7 GEIGER COUNTER—\$135.00



SEND FOR FREE CATALOG FROM  
THE WORLD'S LEADING SUPPLIER—Dept. MW

**THE RADIAC CO., Inc.**

489 Fifth Avenue, New York 17, N. Y.



Andrew Sweet's new laboratory, consulting service and general offices, with a staff of well-known technical men to assist you in:

- Consulting geological service
- Mine and prospect evaluation
- Radioactive Surveys
- Laboratory research
- Assays

JEEP-mounted scintillation equipment

**Sweet's**  
ENGINEERING CONSULTANTS

East 38th Ave. & Elm • Denver, Colo.  
Florida 5-8202

## INTERNATIONAL



### NORTH AMERICA

**QUEBEC**—Installation of auxiliary plant and equipment designed to decrease production costs at the *Quebec Iron and Titanium Corporation's* operation is proceeding on schedule. Piling for the ore crushing and upgrading plants is two-thirds completed, and all major equipment items are on order. The job is expected to be finished by December of this year.

**ONTARIO**—*Blue Rock Cerium Mines* has let a contract for sinking of a three-compartment vertical shaft to a depth of 500 feet at its uranium property 130 miles northeast of Toronto. The immediate program calls for establishment of three levels and a minimum of 4,000 feet of lateral work. Cerium and thorium are known to be present, but this work is essentially to develop the deposit as a uranium mine. Three surface diamond drills are continuing to probe several promising zones. Of the 20,000 feet of drilling completed, over 13,000 feet has been on the main C zone where the shaft is to be sunk.

**ALASKA**—Van Fedder, Wiley Harrell, and Roger Layne have staked 30 claims covering almost a square mile in the Shirley Lake area. Part of the area is underwater, either under Shirley Lake or Long Lake.

**NEW BRUNSWICK**—*St. Joseph Lead Company* of Josephstown, Pennsylvania reportedly will conduct pyrometallurgical tests on concentrate from the 150-ton pilot mill of *Brunswick Mining & Smelting Company* now in operation. The Brunswick project is an amalgamation of properties held by *Brunswick Mining & Smelting Corporation*, *Ancon Lead Mines Ltd.*, and *Leadbridge Mining Company*, a subsidiary of *St. Joseph*. Work last year at the property brought the estimated tonnage of indicated ore to 50,000,000 tons, including 28,312,000 tons of 4.1 percent zinc, 1.6 percent lead, 0.4 percent copper, and 1.4 ounce silver in the No. 6 orebody. Preliminary indications are that the company can mine 6,000,000 to 7,000,000 tons of ore by open pit, and the pit is now being prepared for mining.

**BRITISH COLUMBIA**—*Silver Hill Mines Ltd.* has arranged for more than \$100,000 in new funds with a view to initiating production by midsummer at its silver-lead-zinc mine between Hope and Princeton. Indicated ore is estimated at 65,000 tons averaging 10 ounces of silver and 7 percent to the ton. It is planned to put from 50 to 60 tons daily through the firm's new mill.

**ALASKA**—Several of the large mining companies are reported to be interested in Alaskan minerals again. *Bear Creek Mining Company*, subsidiary of *Kennecott Copper Corporation*, is said to have a field party in the Green Fette area on the Copper River. *Northern Prites Inc.*, subsidiary of *Texas Gulf Sulphur Company*, reportedly is investigating iron deposits on Latouche Island. *United States Steel Corporation*, *W.S. Moore Company*, and *American Smelting and Refining Company* are all rumored to be planning

investigations of iron deposits in the so-called Panhandle of Alaska.

**NORTHWEST TERRITORIES**—*Boreal Rare Metals* is reconstructing its columbium-tantalum mill at Great Slave Lake which was destroyed by fire last January. The crushing equipment will have a capacity of 500 tons daily, and the concentrating equipment will be able to handle 150 tons. The firm has started an extensive drilling program on several dike structures in a search for lithium. Last year two of the dikes were mined for columbium and tantalum, and mill tailings showed lithium content. Drilling to a depth of 100 feet in the Best Bet dike showed indications of 250,000 tons of lithium-bearing material.

**ONTARIO**—*Rare Earth Mining Corporation* has started sinking of a three-compartment shaft to 500 feet on its 1,100-acre property in the Bancroft-Haliburton area. Surface drilling has indicated substantial amounts of uranium.

**BRITISH COLUMBIA**—*Texada Mines Ltd.* is reported to have signed a contract to ship iron ore to West Germany. The initial agreement calls for 100,000 tons, with delivery to start as soon as final terms have been negotiated. *Texada* is also completing a contract with a Japanese firm for about 1,000,000 tons.

**QUEBEC**—*Eldrich Mines'* three-compartment shaft sinking program is making good progress, with a third level currently being established at the 500-foot level. The present schedule calls for sinking to 1,075 feet by October, with seven working levels to be established. Two have already been cut. Surface drilling has outlined a length of 620 feet of the gold-bearing vein calculated to contain 650,000 tons averaging 0.20 ounce per ton across an average width of 20 feet and depth of about 600 feet. A permanent plant and other facilities were completed last fall.

**NORTHWEST TERRITORIES**—*Rayrock Mines Ltd.* is currently winding up its drilling program at its Marian River

## WORLDWIDE PROFESSIONAL DIRECTORY

### AGENCE MINIERE & MARITIME S. A.

2 rue Van Bree, Antwerp, Belgium  
Weights, samplers, assays of ores, metals.  
Agents for shippers to European ports, plants.  
Market surveys, commercial advisors assuring sales direct to customers.

### HERBERT BANKS JOHNSON

#### CONSULTANT

Electrostatic Separation  
Process Developments  
804 Franklin Street Clearwater, Florida

### JOHN F. MEISSNER ENGINEERS, INC.

#### Consulting Engineers

Conveyor Systems Storage Methods  
Crushing Plants Ship Loading Docks  
Materials Handling and  
Processing Plants  
308 W. Washington St. Chicago 6, Ill.

### HARRY J. WOLF

Mining and Consulting Engineer  
Examinations—Valuations—Management  
One Park Place, New York 7, N. Y.  
Cable: MINEWOLF Tel.: REctor 2-5307

uranium property and is driving an adit crosscut. This adit will be driven a distance of 850 feet to intersect four zones 250 feet below the surface. Plant and equipment installation are well advanced and will be fully mechanized, including underground haulage.

**BRITISH COLUMBIA**—Directors of *Silbak Premier Mines* are studying the possibility of reopening the lead-zinc mine at Premier. Considerable damage was done to mine buildings during the severe winter of 1953-54, and many of these might have to be replaced.

**ALASKA**—*Gold Placers, Inc.* has opened up for the spring season at Wood-chopper. George Hellerich and his partners have returned to Pasco Creek near Baribou where considerable drilling was done last summer. The Bill Herings and Johnny Frasca will mine on Eagle Creek.

**QUEBEC**—*Oceanic Iron Ore of Canada* has set up a field camp at Morgan Lake and is diamond drilling the property. Base metal possibilities will also be investigated. Surveys will be made of plant and harbor facilities and all other physical aspects of the operation so that cost studies can be made when winter closes the property down.

**ONTARIO**—*Steep Rock Iron Mines, Ltd.* has adopted an "Off-The-Job" safety program and is working in conjunction with the Atikokan town council, police, recreation commission, and town organizations in making this a community effort. Roger Thew of Steep Rock is also chairman of the Mining Section of the Safety Promotion Committee of the National Safety Council. He is now inviting inquiries from mining firms about this program and will send copies of a summary of the Off-The-Job Safety Committee bulletin to all who are interested. Says Mr. Thew, "Since so many mining ventures and their people are the sole mainstay and supporters of their communities, this type of safety promotion lends itself to our industry and should pay handsome dividends all around. . . . An off-the-job injury prevention program is not only an essential component of an effective on-the-job safety program, but it is a necessary and logical part." Mr. Thew can be contacted care of Steep Rock Iron Mines, Steep Rock Lake, Ontario, Canada.

**ALASKA**—The United States Geological Survey has announced the release of surface and underground geologic maps of the *De Coursey Mountain* mercury mine in the De Coursey Mountain area of the central Kuskokwin region. The maps are on open file at various USGS offices.

**QUEBEC**—*Ascot Metals Corporation Ltd.* has purchased the 1,000-acre *Ducal* group in the LaMotte lithium mining area. Two known mineralized dikes are exposed and surface work is now going on. Ascot is also resuming exploratory work on the *Trio Uranium Mines* properties in the Parry Sound area of Ontario, where surface trenching exposed an euxenite showing.

**ALASKA**—*Red Hawk Mines Alaska, Inc.* has been incorporated to take over the reopening of the *Riverside* mine under a DMEA agreement. This work had previously been planned by *Pacific Northern Minerals* of Spokane, Washington. Directors of the new firm are associated with *Red Hawk Gold Mines Ltd.* of Vancouver, British Columbia.

## E. A. GODOY & CO., INC.

CUNARD BUILDING, 25 BROADWAY

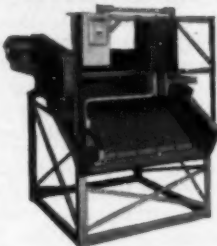
NEW YORK 4, N. Y.

**CHROME ORES** • Refractory • Metallurgical • Chemical

**MANGANESE ORES** • Metallurgical • Chemical

**IRON ORES** • Open hearth • Blast furnace

## New Model E Leahy® Screen Opens New Range of Applications



An entirely new jacket assembly and mounting concept on the Leahy speeds and greatly simplifies screen tensioning and jacket changes; reflected to FlexElex jacket heating the new features provide unmatched mechanical, electrical and thermal efficiencies. The new Model E is now unquestionably the simplest and most versatile screen in the fine mesh screening field. Send for complete data and information.

The DEISTER CONCENTRATOR CO. 925 Glasgow Ave., Fort Wayne, Indiana

Simplify Your Bulk Storage with a

ONE  
MAN

**SAUERMAN  
MACHINE**



Sauerman installations provide economical handling of a wide variety of bulk materials, from bauxite to zinc ore . . . at rates ranging from 10 to 800 cu. yds. per hr. Storage areas range from a small bin to ten acres or more.

Quick change from stockpiling to reclaiming is accomplished by unclamping and re-attaching the operating cables so as to turn the bucket around when the power is applied. Non-caving or free-flowing materials are handled with equal efficiency. The operator can be located in a safe cab overlooking the work area. Many Sauerman installations are remotely operated through air or hydraulic controls.

Let Sauerman engineers show you how to use your storage area to its fullest extent. Send for Catalog E, Bulk Storage by Power Scraper and 32 Tested Methods For Handling Bulk Materials. Request the following Field Reports:

FR-224  
FR-104

Handling Ore with Drag Scrapers  
African Storage of Iron Ores

**SAUERMAN BROS. INC.**

638 S. 28th Ave.

BELLWOOD, ILLINOIS



## Kerr-McGee

(Continued from page 50)

feeds a conveyor leading to the agitators.

The plant has been in operation during an entire winter but no difficulty has been experienced in meeting temperature requirements at the outside curing area. Previously some trouble had been expected from evaporation losses during the cure, but to date none has been encountered. Acid consumption fluctuates over a wide range varying from 250 to 600 pounds per ton of ore treated.

### After Cure Reactions

After the cure, the metallurgy breaks down to three main problems. These are mechanical handling of corrosive liquids containing abrasive solids, provision of sufficient agitation time to break up aggregates, and washing sands free of entrained solution.

Cured ore dumped into the hopper travels by conveyor to four propeller-type agitators equipped with air lifts to reduce abrasion. The ore stream discharged at the head pulley is met with a stream of water, sufficient to produce a pulp containing 50 percent solids. Flow of pulp through the agitators is in series, and the solids are washed free of uranium which goes into solution.

Following an agitation period of one hour, the pulp flows to the first of four Wemco spiral classifiers for a sand slime separation. Approximately 10 percent of the ore goes into solution, 30 percent overflows the classifiers as slimes, and 60 percent reports to sand tailing.

### Sand-Slime Separation

The sands pass through the four spiral classifiers in series. The solids in the final classifier are given a dilute acid wash (pH adjusted to 1.5) to prevent precipitation of uranium because sands from this classifier go to waste. The classifiers, in effect, scalp off and eliminate ¾ of the solids carried in the solution. In addition, they form a reservoir of additional holding capacity and provide time to leach the last remaining bit of uranium which has not previously gone into solution.

A Dorrcclone has been installed in the circuit to treat the overflow from the Number 1 classifier. It makes a separation at 100 mesh, with the underflow reporting to the classifier

Number 2, and the minus-100-mesh overflow reporting to the first of four thickeners in the modified counter current decantation installation. The overflow of classifiers 2, 3, and 4, are pumped to thickeners 2, 3, and 4, respectively, in the modified CCD system, they are discharged to the thickeners over baffled launders to insure good mixing and maximum washing.

### Clarifying

The term "modified CCD" is more correctly applied, since thickener underflow advances through four thickeners in series with the overflows from Number 2, 3, and 4, reporting to spiral classifiers, rather than advancing counter to the underflow. Thickener underflows are removed by Wemco acid resistant pumps. Pregnant solution is removed from Number 1 thickener. Coarse sand tails are removed at the fourth classifier and slime tails from the fourth thickener.

The success of the flocculating reagents in clarifying leach liquors has produced fast settling rates. Solids settle at the rate of several feet per minute and the overflow from the first thickener contains two parts of suspended solids per million.

Uranium is recovered from the clarified leach liquors overflowing the Number 1 thickener by processes which include an ion exchange step. The final product is a granular yellow ammonium diuranate, which is easily washed and filtered in an Eimco-Burwell unit. The Dorrcclones were installed in the circuit for the purpose of relieving the load of solids reporting to the thickeners.

### Filtering

Supervisors at Kerr-McGee have been especially pleased with the ease with which the final product can be filtered and washed. The complete cycle in the Eimco-Burwell, modified plate and frame filter takes about 4 hours. The filter is loaded at an operating pressure of 40 pounds per square inch, and a displacement wash follows. When operating pressure is released, plates are retracted by applying a vacuum which frees the loaded frames. The frames are cranked out and the filter cake dropped to wood trays. The yellow precipitate is transferred to a tray dryer using natural gas for heat.

One interesting metallurgical problem is the creation of calcium sulphate in the ore through the acid-

lime reaction. This material has exhibited a tendency to coat particles during the cure, thus slowing the sulfating action. Some  $\text{CaSO}_4$  dissolves when the ore is pulped, but eventually precipitates on walls of tanks and pipes.

### Instrumentation

Working controls for the operators have been provided throughout the mill. The flow of ore out of the six 250-ton bins is readily and easily adjusted by damping the vibrations of the Syntron feeders on the bin draw points. For this purpose rheostats actuated by a panel control board is used. Blended ore is weighed on a Fairbanks-Morse conveyor scale.

The sulphuric acid storage tanks, of which there are ten rated at 100 tons of acid each, are equipped with Pressuretrol devices for inventory records. This instrument also sounds warnings which alert the operator when a tank on the line is running dry. It also sounds a warning when it is being loaded so that overfilling is prevented.

Acid transfer from the storage tanks to the 1,000-gallon day tank by Worthington acid pumps in completely automatic once a storage tank is placed on the line. A Minneapolis-Honeywell pneumatic remote control system starts or stops the Worthington pump depending on the day tank level.

Fischer-Porter flowmeters on the Allis-Chalmers mixer, where ore, water, and acid are pugged, measure and control reagent addition.

Beckman Instruments pH meters coupled with Minneapolis-Honeywell recorders are spotted at various points in the circuit. One critical position is at the number 4 classifier. At this point pH should be sustained at 1.5 to prevent precipitation of uranium prematurely.

As one supervisor puts it, it may be that the operators here don't realize just how many controls they actually do have working for them.

MINING WORLD wishes to express thanks and appreciation to the entire staff of the Navajo Uranium Division of Kerr-McGee Oil Industries, Inc. for permission to visit the Shiprock plant and the opportunity to prepare this report. We are especially grateful for the assistance of Clyde Osborn, the capable general superintendent of the Shiprock plant.



## U.S.A. Metal & Mineral Prices

### METALS

June 6, 1955

COPPER:	Electrolytic. Delivered F.o.b. cars, Valley basis	36.00¢
	Lake. Delivered, destinations, U.S.A.	36.00¢
	Foreign Copper, Valley basis	36.00¢
LEAD:	Common Grade, New York	15.00¢
	Tri-State Concentrates, jig, flotation 80% lead, per ton	\$187.50
ZINC:	Prime Western; F.o.b. E. St. Louis	12.00¢
	Prime Western; Delivered, New York	12.50¢
	Tri-State Concentrates, 60% zinc, per ton	\$72.00
	Primary 30 Pound Ingots (99% plus). F.o.b. shipping points	23.20¢
ALUMINUM:	Low Scar Brand. F.o.b. Laredo, in bulk	29.00¢
ANTIMONY:	(in ton lots) price per pound	\$2.25
BISMUTH:	Sticks and bars, 1 to 5 ton lots (Price per pound)	\$1.70
CADMIUM:	97-99%, keg of 550 pounds (Price per pound)	\$2.60
COBALT:	Powder	Nam., per pound \$119.25
COLUMBIUM:	98% (per pound)	\$10.00-\$13.00
LITHIUM:	Ingots (99.8%) F.o.b. Valasco, Texas, per pound	\$295.00-\$298.00
MAGNESIUM:	Flasks, Small lots, New York	64.50¢
MERCURY:	"P" Ingots (3 pounds). F.o.b. refinery, Port Colborne, Ontario	91.75¢
NICKEL:	Grade A. Brands, New York (Price per pound) Prompt delivery	\$3.50-\$3.95
TIN:	99.3% + Grade "A" (Price per pound)	\$35.00 per ounce
TITANIUM:	United States Treasury Price	90 1/2¢ per ounce
GOLD:	Newly mined domestic. United States Treasury price	90.25¢
SILVER:	Foreign Handy Harmon	\$76.00-\$79.00
PLATINUM:	Per Ounce	\$10.00
ZIRCONIUM:	Sponge, Per Pound	\$10.00

### ORES AND CONCENTRATES

BERYLLIUM ORE:	10 to 13% BeO. F.o.b. mine, Colorado	\$47.00 per unit
	Small lot purchases at Custer, S. D., Spruce Pine, N. C., and Franklin, N. H.	
	Visual inspection at \$400.00 per short ton or by assaying at: 8.0 to 8.9% BeO, \$40 per unit; 9.0 to 9.9%, \$45; over 10.0%, \$50.	
CHROME ORE:	F.o.b. railroad cars eastern seaports. Long tons dry weight.	
	African (Rhodesia), 48% Cr <sub>2</sub> O <sub>3</sub> , 3 to 1 Ratio	\$44.00-\$45.00
	African (Transvaal), 48% Cr <sub>2</sub> O <sub>3</sub> , No Ratio	\$31.00-\$32.00
	Turkish, 48% Cr <sub>2</sub> O <sub>3</sub> , 3 to 1 chrome-iron ratio	\$46.00
	U. S. Government ore purchase depot Grants Pass, Oregon. Base price, jumpy ore, \$115.00; fines and concentrates \$110.00 for 48% Cr <sub>2</sub> O <sub>3</sub> and a 3 to 1 chromium-iron ratio. Premiums for higher grade ore and for a ratio up to 3.5 to 1. Penalties for grades down to 42% Cr <sub>2</sub> O <sub>3</sub>	
COLUMBIUM:	At United States small lot beryl purchase depots, \$3.40 per pound contained	
TANTALUM ORE:	combined pentoxides in "0" ore. Includes 100% bonus. (Government stopped	
IRON ORE:	buying May 12)	
	Lake Superior. Per gross ton Lower Lake Ports	
	Mesabi, Non Bessemer, 51.5% Fe. Second quarter	\$10.10
	Mesabi, Bessemer, 51.5% Fe. Second quarter	\$10.25
	Old Range Non Bessemer. Second quarter	\$10.40
	Old Range Bessemer. Second quarter	\$10.40
	Swedish, Atlantic Ports, 60 to 68% Fe. Contracts, Per Unit	\$22.00¢
MANGANESE ORE:	Metallurgical grade, 48 to 50% Mn. Long ton unit	\$0.89-\$0.91
	Metallurgical grade, 46 to 48% Mn. Long ton unit	\$0.87-\$0.89
	Metallurgical grade, 45 to 46% Mn. Long ton unit	\$0.77-\$0.82
	Chemical grade, 80% MnO <sub>2</sub> . Per Ton	\$70.00
	Domestic U. S. Government ore purchasing depots: Deming, New Mexico;	
	base price \$2.30 per long dry ton unit of recoverable manganese less	
	handling and treating costs. Butte, Montana; (black and pink ores) base	
	price of \$4.87 per long dry ton of 18% manganese ore. Phillipsburg,	
	Montana base price of \$6.43 per long ton unit of 15% manganese ore.	
	Small lot program f.o.b. railroad cars, minimum 40% Mn. Base price (48%)	
	\$2.30 per unit with premiums and penalties.	
	90% MoS <sub>2</sub> F.o.b. Climax, Colorado. Per pound of contained	
	molybdenum, plus cost of containers	\$1.05
	Domestic, 60% WO <sub>3</sub> Per short ton unit	\$63.00-\$65.00
	Foreign, 65% WO <sub>3</sub> Per short ton unit (Scheelite)	\$33.00
	Foreign, South American, Spanish, Portuguese	\$31.00-\$32.00
	Carnotite-Roscoelite. F.o.b. purchase depot plus \$0.06 per ton mile (\$6.00	
	maximum), Grand Junction, Rifle, Durango, Naturita and Uravan, Colorado	
	Salt Lake City, Marysville, Thompsons, Moab, White Canyon, Glen River,	
	Monticello, Utah, Shiprock, and Bluewater, New Mexico, Edgemont, Wyo.	
	Dakota, Riverton, Wyoming, and Custer, Arizona. Base price for 0.10% ore	
	is \$1.50 per pound and up to \$3.50 per pound of contained U <sub>3</sub> O <sub>8</sub> plus \$0.75	
	per pound for each pound in excess of 4 pounds per short dry ton and an	
	extra allowance of \$0.25 per pound for each in excess of 10 pounds. A	
	\$0.50 per pound development allowance paid on all ore purchases. At Ship-	
	rock all ores with more than 6% lime are penalized for excess lime.	
	Carnotite-Roscoelite. V <sub>2</sub> O <sub>5</sub> in ratio of more than 10 parts to 1 part of U <sub>3</sub> O <sub>8</sub>	
	are generally acceptable at all AEC depots, but excess not paid for at Marys-	
	ville, Monticello, Shiprock, and Bluewater	Per Pound V <sub>2</sub> O <sub>5</sub> \$0.31

### NON-METALLIC MINERALS

BENTONITE:	Minus-200-mesh. F.o.b. Wyoming points. Per ton in carload lots	\$12.50
	Oil Well grade. Packed in 100 pound paper bags	\$14.00
FLUORSPAR:	Metallurgical grade, 70% effective CaF <sub>2</sub> content per short ton F.o.b.	
	Illinois-Kentucky mines	\$28.00
	Mexican, 70% f.o.b. border	\$22.00
	European, Atlantic Ports, 70%	\$30.00
	Acid Grade, 97% CaF <sub>2</sub> Kentucky, Illinois, Colorado	\$50.00
PERLITE:	Crude: F.o.b. mine per short ton	\$3.00 to \$5.00
	Plaster grades. Crushed and sized. F.o.b. plants	\$7.00 to \$9.00
SULPHUR:	Long ton, F.o.b. Hoskins Mound, Texas	\$25.50
	Export	\$30.50

## LONDON METAL AND MINERAL PRICES

April 18, 1955

Per Long Ton USA Equivalent cents per pound:

COPPER:	Electrolytic, spot	E346	0s Od	43.25¢
LEAD:	Refined, 99.9%	E102	5s Od	12.78¢
ZINC:	Virgin, 98%	E 89	0s Od	11.12
ALUMINUM:	Ingots, 99.5%	E163	0s Od	20.37¢
ANTIMONY:	Rogues, 99.4%	E222	10s Od	27.81¢
TIN:	Standard, 99.75%	E715	10s Od	89.44¢
TUNGSTEN:	Long ton unit, 247s equivalent to \$34.58			

Quotations on metals and certain ores through the courtesy of American Metal Market, New York, N. Y.

JULY 1955

[World Mining Section—61]

**Pacific**  
"SLUSHMASTER"  
SCRAPERS  
Move More Muck  
at less cost



U.S.A. and  
Foreign Patents Applied For

1. Pacific "Slushmasters" are standard equipment with many leading mining companies.
2. They stand up under the toughest service.
3. They help you move more muck at less cost.
4. Our very best advertising is provided by satisfied customers. Write us for names of those in your area.

#### TEN SIZES

MODEL	SIZE	WEIGHT
2A	26"	398#
2A	30"	485#
2A	34"	515#
AB	36"	744#
AB	42"	817#
AB	48"	951#
2B	36"	1280#
2B	42"	1395#
2B	48"	1570#
2C	60"	2360#

- Let us send you copies of New Bulletins No. 253 and No. 254 which give specifications and operating features of Pacific "Slushmaster" Scrapers; also name of representative in your area.
- Use Pacific Sheave Blocks, Sheave Anchors,
  - "Round-The-Corner"
  - Sheave Blocks, Jaw
  - Crushers, Bit Knockers and
  - Pacific Wearing Parts.

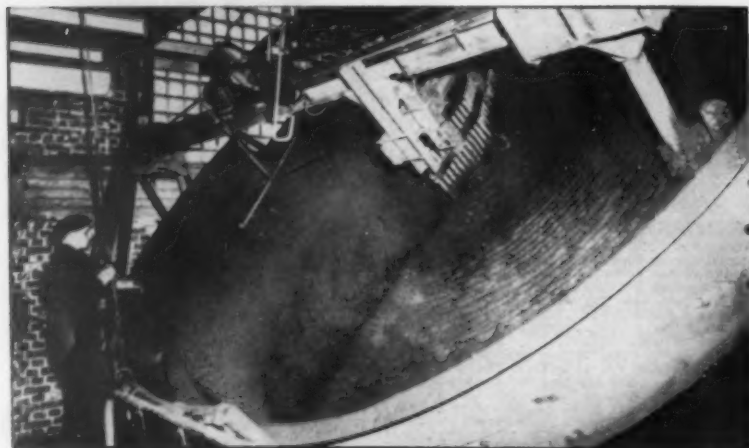


**ALLOY STEEL  
& METALS CO.**

1848 E. 55th St., Los Angeles 58, Calif.  
Mailing Address: Box 58323 Vernon Sta.  
Los Angeles 58, Calif.

# PRODUCTION EQUIPMENT PREVIEW

PEP is just what new equipment, increased mechanization, and new methods can give to your mine, mill or smelter. This PEP section is MINING WORLD's way of making available to you some of the finest current information on mechanization.



## INCO to Use Dravo-Lurgi Pelletizing Disc

Shown above is one of the 16-foot Lurgi Pelletizing Discs which is being installed at International Nickel Company's new \$16,000,000 iron ore plant near Copper Cliff, Ontario, Canada. The disc, which reportedly will be the first one in North America for pelletizing iron ore, was developed four years ago by Lurgi, Germany's largest designer and manufacturer of sintering and pelletizing equipment. Dravo Corporation of Pittsburgh, Pennsylvania, manufacturer of Lurgi equipment in the United States, was the supplier for INCO's disc. The Dravo-Lurgi process, which has been in commercial operation in Europe for several years, produces iron ore pellets without using binders, plasticizers or solid fuels. For information on Dravo's pelletizing disc, circle No. 80.



## New Horizontal Vibrating Screen by Link-Belt

A completely new horizontal vibrating screen has been added to Link-Belt's line of screening equipment. The new screen—known as Straightline—is especially suited for de-watering high capacity loads and sizing of material where headroom is limited. The new screen has a lower silhouette, although all the advantages of high-intensity straightline action are retained.

The Straightline has two vibrators, one mounted on each side of the screen at deck level. Both are located at the center of gravity, so that uniform vibration is assured. They do not project above the sideplates, and thus headroom is held at a minimum.

Straightline screens are available in sizes from 4- by 8-feet to 6- by 20-feet with either one or two decks. For Data Sheet 2562 on the Straightline, circle No. 71.



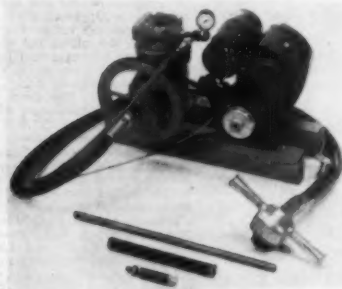
## Gardner-Denver Announce New Air Trac Drilling Rig

If you are drilling on steep terrain and on rough and rocky drilling sites, the new self-propelled drill carrier announced by Gardner-Denver Company may be your answer. The Air Trac is said to have proved its superiority on such locations over the conventional wheel-mounted wagon drill carriage.

The Air Trac consists of a hydraulically actuated T-bar mounted on two self-propelled crawler treads each powered by a Gardner-Denver air motor.

Traction power developed is sufficient to haul an 11,720-pound compressor up a 10% grade. The T-bar supports a Gardner-Denver chain feed and rock drill. The T-bar controlling height of the chain feed is positioned by a hydraulic hand pump that actuates two lift cylinders. Once the T-bar is positioned and the hydraulic mechanism locked, the T-bar position is self-equalizing and load distribution on the two crawlertracks is self-stabilizing.

The mobility of the Air Trac enables the operator to spot holes quickly and accurately, and the exceptional stability of the T-bar increases drilling efficiency. For full details, circle No. 70.



## Powermite Rock Drill Is Ideal for Prospecting

A completely portable lightweight but powerful drill for the miner and prospector is now being marketed by Prosser Powered Products. The drill puts down a 1-inch hole, and is powered by a 3½-horsepower gasoline engine equipped with a recoil starter. Power is transmitted through an automatic clutch and a flexible shaft direct to the backgeared drill head. The gasoline engine also drives the compressor, shown in the picture, which furnishes high pressure air to keep cuttings in suspension and blown from the hole. Full throttle control at the operator's hand allows complete speed control. Total weight of engine, compressor and drill is 75 pounds. Circle No. 64 for complete information.

## New Scintillation Survey System for Exploration

A new scintillation survey system for aerial and ground radioactivity exploration has been announced by Nuclear Instrument and Chemical Corporation, Chicago, Illinois. The complete DS-7 system consists of a scintillation detector with a three-inch sodium iodide crystal, a rate-meter, chart recorder, and buzzer alarm to alert the pilot or observer. The system weighs less than 75 pounds, and features low power consumption (60 watts). For complete details circle No. 63.

**PORTO-DIAMOND DRILL** for use with water or air is announced by Uranium Enterprises. Model 630A with 6 hp. motor and built-in water pump weighs only 44½ lbs and Model 999 with 9 hp. motor and built-in water pump weighs 51 lbs—both one-man rigs. For further information, circle No. 1.

**NEW DESIGNS FOR SCREENS:** Hewitt-Robins Inc. has announced the development of a new vibrating screen which they describe as of revolutionary design. A unique system of rubber and steel springs upon which the screen frames are mounted is said to offer higher screening efficiency and cut power requirements 50 to 75 percent. Sizes will be 4-by 10 to 6-by 28-feet. Circle No. 2.

**ELECTRIFUGAL PUMPS** are described in a new bulletin released by Allis-Chalmers Manufacturing Company, 985 South 70th Street, Milwaukee, Wis. The Electrifuugal pumps are available in capacities to 2500 gallons per minute and feature several sealing arrangements which are available originally or as field modifications. For details write the company or circle No. 3.

**NEW BEARING UNIT:** A two-bolt flange ball bearing unit is being marketed by the Sealmaster Division of Stephens-Adamson Mfg. Co. The new unit eliminates two fasteners as well as the punching or drilling operation for two mounting holes. It also cuts installation costs and allows for closer bearing spacing on multiple shaft installations. Circle No. 4.

**"LOW COST PRODUCERS"** is the title of a new booklet published by Caterpillar Tractor Company describing a unit that is said to move more material at lower costs. Four-wheeled tractors equipped with scrapers and wagons are shown on a variety of jobs throughout the world. For a copy circle No. 5.

**DIAMOND BIT CATALOG:** Diamond Tool Research Co., Inc. of New York has recently issued a four-page catalog covering its complete line of diamond drill bits and reaming shells. A choice of three matrices enables you to select the one best suited to your drilling conditions. Diamond Tool, a prime importer of diamonds, also offers rapid resetting service which is described in the Catalog. For your copy and a price list circle No. 6.

**NEW CATALOG, No. 554,** containing fifty pages of technical data, brief descriptions and photographs of vibratory equip-

ment, feeders, conveyors and other materials handling equipment has been published by Syntro Company, 166 Lexington Ave., Homer City, Pa. For a copy circle No. 7.

**TRACTOR SHOVELS:** The all-wheel drive Michigan Model 175-A, with a 2½-cubic yard bucket, and the smaller 175-yard Model 125-A tractor shovels are described and fully illustrated in a new 12-page catalog offered by the Construction Machinery Division of Clark Equipment Co. Discussions are brief but very informative. Copies can be obtained by writing to the company at Benton Harbor, Michigan or by circling No. 8.

**MINERAL DRESSING NOTES,** Number 22, by American Cyanamid Company describes handling and feeding of Aero brand cyanide. General handling notes and operating practice are included in the 15-page discussion. Circle No. 9.

**VIBRATING MECHANISMS:** The precision constructed, jig-assembled, Deister United Lifetime Vibrating Mechanism is now available for smaller size vibrating screens. It can now be specified for Deister vibrating screens in sizes 3-by 6 to 6-by 14-feet. Deister Machine Company will furnish details. Circle No. 10.

**SEMI-AUTOMATIC TRANSMISSION:** A new 8-speed semi-automatic transmission is now in production at the Transmission Division of Fuller Manufacturing Co., Kalamazoo, Mich. Designed for on- and off-highway trucks in the 150 to 200 hp. class, all forward speeds are controlled by a single shift lever. Circle No. 11.

**PORTABLE POWER CORDS:** A complete line of portable cords for rugged applications has been announced by Anaconda Wire & Cable Company. The line includes Securityflex cord, Industrial cord and Service cord for application under severe operating conditions. Circle No. 12.

**LARGEST DIESEL MODEL** in International Harvester Company's line of 18 heavy-duty power units is described in an eight-page booklet. The six cylinder, valve-in-head engine develops 190 horsepower at 1,400 rpm. For a copy circle No. 13.

**DUST DIVERter** for Compressed Air Drill Rigs used in Uranium and other metal prospecting rigs and bench drilling equipment. This new tool is designed to eliminate all dust and cuttings from drill-

ing machinery and away from the operator. Manufactured by Shaffer Tool Works of Brea, California, the Dust Diverter is an adaptation of a successful tool which Shaffer has manufactured for several years for the oilwell drilling industry. For complete information circle 41.

**"9 PROFITABLE MINUTES FOR CONTRACTORS"** is title of new Hyster booklet which sets forth a new guide to increased tractor productivity through the use of proper attachments aiding various types of earthmoving and mining jobs. To obtain a copy circle 42.

**HARDSURFACE ELECTRODES** for Tractor and Shovel Maintenance. New reference chart and literature issued by Rankin Manufacturing of Los Angeles provides handy specifications and reference source eliminating all guess-work in building up wearing parts such as rails, sprockets, idlers, grousers and rollers on leading makes of tractors and shovels. Included is a new idea in cutaway templates that can be used in measuring amount of wear on equipment parts. To obtain copy circle 43.

**NEW RADIOMETER** with interchangeable probes of varying sensitivity and adaptable to motor vehicle or airborne applications is offered by the Nuclear Instrument Co. of Venice, California. The variable probe arrangement of this line of counters permits new combinations of instruments equal in performance to other types of units normally required for such a wide range of work and costing three to 10 times as much. For further information circle 44.

**TRAMP IRON PROTECTION:** Dings Magnetic Separator Company describe their In-Line Rectangular Self Cleaning Magnets in RM Catalog 1315A. The In-Line unit is a self-cleaning version of the Dings RM rectangular magnet, available in standard sizes to meet almost any belt speed, width or burden. Circle No. 25 for a copy.

**DUST RECOVERY:** Western Precipitation Corporation describe their Dualaire dust recovery units in a 12 page booklet. The Dualaire uses a reverse-jet cleaning action which continuously cleans the filter tubes. The booklet shows how the unit is adaptable to a wide range of operating requirements. For a copy of the descriptive booklet Circle No. 34.

**Circle numbers and mail this card for free product literature**

to get further information on any item described in the *Production Equipment Preview*, note the key number of that item, circle the corresponding number on the PEP card at the right, and mail. If mailed from a point outside the United States, proper postage must be used.

**PLEASE PRINT**

**This card may also be used to subscribe by filling in here**

See other side for subscription rates

**JULY 1955**

**NOT GOOD IF MAILED AFTER SEPTEMBER 23**

FILL IN  
NUMBERS OF  
ITEMS YOU  
DESIRE

1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70	71	72	73	74	75	76	77	78	79	80

Also send further free information on the equipment advertised on pages:

.....) Product ..... Manufacturer .....

.....) Product ..... Manufacturer .....

Name ..... Title .....

Company .....

Address .....

Use this section to subscribe only

☐ New

Subscription Name ..... Title .....

☐ Renewal Company .....

☐ 1 yr. \$3 Address: .....

☐ 2 yr. \$3 .....



**REDUCE FRONT END DRAG:** Warn Manufacturing Co., Seattle, Wash., point to many advantages which the application of Warn Hubs provide for both on-highway and off-highway vehicles. The Hubs are said to eliminate front wheel drag when the vehicle is used in 2-wheel drive range, and cuts down axle torque when used in 4-wheel drive range. Circle No. 35.

**NEW ADJUSTABLE SPEED DRIVES:** American Pulley Company announces a new wide range adjustable speed drive which has increased the capacity of the single groove type so that it will transmit up to 30 horsepower. The drive permits a speed variation of as much as 100 percent at horsepower capacities comparable to the former drives having 2 or 3 belts. Get additional details by circling No. 30.

**DUAL VANE PUMP** for mobile equipment has been announced by New York Air Brake Co. The series PFM-100 pump is designed for high speed direct engine drive and is built to withstand continuous operation at 2,000 pounds per square inch. Circle No. 31.

**SIMPLIFIED FUEL SYSTEMS** for P & H Diesels has been announced by the Harnischfeger Corporation. The new fuel system eliminates a total of 131 separate parts and is 49.5 pounds lighter in weight. The new design requires less maintenance, reportedly starts easier and improves torque characteristics. For further information circle No. 16.

**DIESEL AND GAS ENGINES:** A new 12-page bulletin, No. 239, has been published by Nordberg Manufacturing Company. The publication describes Nordberg Power Chief Diesel and gas engines, and shows installation views, specifications and pertinent data. Circle No. 17.

**AIR CLASSIFIER:** Hardinge Company, Inc. has issued a four-page folder on its Gyrotor. The Gyrotor is a device for continuous separation of an airborne mixture of coarse and fine particles and is used as an independent sizing unit or in closed circuit with a grinding mill. No. 15 will reserve a copy.

**SPECTROPHOTOMETERS:** A new eight-page brochure on the several types of recording spectrophotometers manufactured by Beckman Instruments, Inc., Fullerton, California is just off the press. Bulletin 405 was written to assist the prospective purchaser and details the requirements for a variety of quantitative and qualitative applications. Circle No. 18.

**REDESIGNED GEIGER** counter, the 1955 Model DG-2, made by Detectron Corp. has been recently announced. The instrument sells for \$98.50 F.O.B. North Hollywood, and operates on low cost batteries. Circle No. 19.

**FAILING LOGMASTER** is designed specifically for bore hole surveys and can be used for a wide variety of standard operations. The unit plots logs of electric, caliper, gamma ray, and temperature measurements for exploration. It will plot any two surveys simultaneously. It is marketed by George E. Failing Company. Circle No. 20.

**ELECTRICAL PLUGS:** The Joy Manufacturing Company announces publication of a 12-page bulletin (No. B59) that illustrates and describes their electrical plugs and receptacles. The information provided is brief, yet pertinent. Requests should be sent to the company at the Henry W. Oliver Bldg., Pittsburgh 22, Pa., Dept. J-51, or circle No. 21.

**DORRCLONES:** A new 6-page bulletin by Dorr-Oliver Inc. describes the Type M Dorrclone. The physical characteristics, development and capacities are covered. The Type M Dorrclone consists of molded rubber block cyclones, either 30 or 50 mm. in diameter, installed in a common housing. Circle No. 22.

**AEROFLOC REAGENTS:** American Cyanamid Company has prepared a brochure on Aerofloc reagents. If you have a thickening or filtration problem, this will make profitable reading. Circle No. 23.

**MINE ROOF BOLTS** and how they provide safe, economical, efficient and quality roof bolting are described in a booklet published by Republic Steel Corporation. New, forged-steel wedge nut and forged-steel rigid shell assembly is explained. Circle No. 24.

**CLASSIFICATION:** The type FR Dorrclone and its capacity and range of separation is discussed in an 8-page bulletin. Adaptable to a variety of wet processing operations, the type FR is completely rubber lined with fixed feed opening and variable vortex finders and apex openings. Circle No. 46.

**NEW LOGGING UNIT** for bore holes has been announced by Uranium Engineering Company of Grand Junction. The new unit, called the BABBELogger, employs transistors for the first time in a radiation counter according to the manufacturer. This is expected to increase bat-

tery life and eliminate failure due tube wear or breakage. Circle No. 26.

**SYMONS V-SCREEN**, specifically designed for fine screening, for sizing, de-watering, dedusting, cleaning and washing, is described by Nordberg Manufacturing Company in Bulletin 243. The manufacturer says it is the only screen that does not depend on gravity alone for screening action. Centrifugal and gravitational forces are combined to multiply the screening effect. Circle No. 27.

**A NEW TURBODIESEL** engine has been developed by Cummins Engine Company which is light in weight. The 175 horsepower engine weighs 800 pounds less than other Cummins Diesels of equivalent horsepower and is comparable in weight to gasoline engines. The new engine combines high horsepower, light weight and low cost operation for trucks in the 19,500 to 26,000 GVW class. Circle No. 29.

**LARGE SCRAPERS** introduced by Wooldrige Manufacturing Division, Continental Copper & Steel Industries, Inc. of Sunnyvale, Cal. are said to be the biggest standard models (41 cubic-yards) ever available, and the first to offer the new wide base tires for greater flotation and carrying capacity. For details of the tractor drawn scraper circle No. 32.

**SPEED CHANGES** with stationary or motion control Vari-Pitch sheaves are detailed in a bulletin by Allis-Chalmers Manufacturing Company. Speed variations up to 76 percent, in capacities ranging from 1 to 600 hp. are covered. Circle No. 14.

**VIBRATING SCREENS:** Syntro Company of 166 Lexington Ave., Homer City, Pa., have added a new vibrating screen to their line. The new Syntro-Sinex screen is available in single or double deck models either in open style or totally enclosed. For information circle No. 33.

**IMPROVED SCINTILLATION** made by Precision Radiation Instruments, Inc., features a special percent meter making calibration for uranium content much easier. Direct reading of the percentage of  $U_3O_8$  in an ore is greatly simplified. Another important first is the new high sensitivity range. It is now possible to obtain readings on four different scales. The new Model 107C has a large, 1 1/2-inch sodium iodide crystal and is shockproof, waterproof and completely tropicalized. For details circle No. 47.

For Free Product Literature  
see other side

#### SUBSCRIPTION RATES:

(Including the annual Review and Directory)

NORTH, CENTRAL AND SOUTH AMERICA:	one year \$3
OTHER	two years \$5
COUNTRIES:	one year \$4
	two years \$7

#### SUBSCRIPTIONS IN STERLING

one year 1/5/1
two years 2/10/0
three years 3/12/8

#### CANADIAN CURRENCY:

one year \$3
two years \$5

Harold P. de Loose  
MINING WORLD  
c/o Harold P.  
de Loose Ltd.  
8, Peter Street  
Manchester 3, England  
MINING WORLD  
Royal Bank Bldg.,  
Vancouver,  
British Columbia,  
Canada

#### FOREIGN READERS NOTE:

The copy of World Mining you are receiving consists of carefully selected material from the complete American edition of Mining World to which the above subscription rates apply. If you would like to receive the complete Mining World, fill in the lower section of the reverse side of the card at the left. The card must carry proper postage if mailed from a point outside of the United States. You may send payment or be billed later.

Postage  
Will Be Paid  
by  
Addressee

No  
Postage Stamp  
Necessary  
If Mailed in the  
United States

## BUSINESS REPLY CARD

FIRST CLASS PERMIT No. 3420, Inc. 24,9, P. L. & E. San Francisco, Calif.

MINING WORLD—WORLD MINING

121 SECOND STREET

SAN FRANCISCO 5,

CALIFORNIA

U. S. A.





### New Drill Rig Built Around Self-Propelled Compressor

Schramm, Inc. now offers a new drill rig built around a self propelled compressor. Now you can buy one machine and you are in the drilling business. Rated capacity is 500 feet of 4½-inch hole. Drill pipe is 2½-inches (O.D.), so holes down to 3¼-inch in diameter can be drilled. Hydraulic rotating and down pressure is furnished by a tandem pump. The prime mover is a Schramm 125 cubic-feet-per-minute Pneumatractor with a rated speed of 10 to 12 miles per hour. Standard equipment includes a dust head with rubber baffles and discharge snout. For complete details circle No. 67.



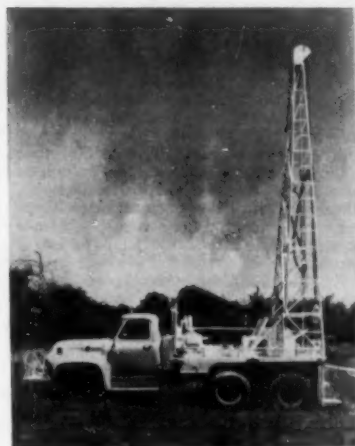
### Deep Radioactive Logging Possible with Scintilogger

Radioactivity logging of drill holes to 6,000 feet is now possible with the new Deep Drill Hole Scintilogger announced by the Radiac Company, Inc. Its verified in-hole-out-hole radiation profiles indicate deeply buried uranium deposits and identify oil productive zones in new wells as well as new productive zones in old wells.

The Scintilogger is a portable, self-contained logging system which includes a scintillation well logging probe, a minimum of 2000 feet of cable, surface control box and graphic strip chart recorder synchronized to a footage counter. Complete descent through water and mud in uncased holes is assured as the stainless steel probe can be weighted; it is mounted on a steel cable having a breaking strength of 1500 pounds and a rated strength of 900 pounds.

Time constants and sensitivity ranges are controlled at the surface so as to provide as much or little detail as desired. Section of interest can be re-logged at expanded scale while in the well, and the

log can be correlated with electric logs and cores while in operation. For more information on the Scintilogger, circle No. 69.



### Drill Four Ways With A DAMCO Portable Drill Rig

Only minor adjustments are required for fast Seismograph shot hole, blast hole and water well or core drilling with the new line of rigs recently introduced by the Drilling Accessory Manufacturing Company. These portable drill rigs are available in two sizes and have been designated AR-1250 and AR-2000 by DAMCO.

Among the many special features incorporated in these rigs is DAMCO's standardization of air clutches in the drums and the use of hydraulic torque converter coupling and auxiliary trans-

mission on the mud pump. In addition, the rigs have all chains and bearings operating in an oil bath and all chains and the same size to cut parts cost. This uniformity extends to the hydraulic pistons, ring gears and pinion. The latter is a valuable economy and convenience feature, particularly where the rigs are used in foreign countries or isolated regions. For specifications on this new line, circle No. 79.



### Mobile Lab Has Testing Facilities That "Travel"

A traveling laboratory is the latest addition to Denver Equipment Company's line of equipment with the announcement of their Mobile Ore Testing Laboratory. This compact unit provides facilities for sampling, testing, development of flowsheets for mills, tailing dumps or new deposits, and is particularly recommended for governmental exploration programs or for companies with widespread holdings. Deco Bulletin No. LG3-B11 gives you the data on this mobile laboratory and also includes illustrations and diagram of the Denver Truck Mills engineered to handle flotation, gravity concentration, cyanidation and heavy media separation under field conditions. For more information on these units circle No. 77.



### New Coach For Prospectors

No terrain is too rough for this rugged new coach which has been especially designed for the prospector and sportsman. Selling for only \$795 F.O.B. Los Angeles, it is designed to fit the bed of the Willys Jeep and other makes of pick-ups capable of navigating rough terrain in mining country. Unit is equipped with Butane stove, sink, ice-box, 6 and 110-volt lights and is attractively appointed with linoleum floor and leatherette furniture and cushions. The exterior is made of heavy gauge all-aluminum. For further information write to Nuclear Instruments Corp., 350 W. Washington Blvd., Venice, California, or circle 45 on the Reader Inquiry Card.

## AEC Drills U<sub>3</sub>O<sub>8</sub> Prospects In Globe-Young Area

Diamond drilling on promising uranium ore structures in the Globe-Young area of Gila County, Arizona, has been started by the U. S. Atomic Energy Commission. Site of the first test drilling is the Blevins Canyon group of claims, in the northwestern part of the Sierra Ancha Mountains. Actual drilling is being done by a United States Bureau of Mines crew under the direction of the AEC. It is the first diamond drilling done by AEC in Arizona, except in the Four Corner area — the extreme northeastern section of the state.

According to M. L. Reynier, chief of AEC's Phoenix suboffice, drilling is expected to continue for several months, possibly in several places. It is believed that information on the structure of the uranium deposits and their possible relation to certain rock formations could materially aid in prospecting for uranium in the area, and reduce the cost of exploration required to evaluate new areas. Information obtained by the AEC will be given immediately to claim-holders, and released shortly afterwards to the public.

## GSA Closes Wenden, Ariz. Manganese Purchase Depot

The General Services Administration's ore-purchasing depot at Wenden, Arizona, was closed on May 10, 1955, when the allotment of 6,000,000 long ton units of recoverable manganese had been purchased. The shutdown of the government's buying station means the virtual

cessation of small manganese mining in western Arizona since there is no longer a market for the low-grade ores produced. A few of the larger operators are continuing to produce and are shipping their output to the GSA depot at Deming, New Mexico.

Between January 1, 1955, and the closing date, there had been almost 100 active shippers to Wenden. Eight producers had averaged over 100 tons of ore a week, three averaged over 500 tons a week, and one shipper had averaged over 1,000 tons a week. Percentage-wise, since the first of the year, 12 major shippers accounted for 86 percent of all deliveries, and three of them for 57.5 percent.

As the cut-off date for receiving ore drew nearer, shipments reached new highs. On April 25, the station received 87 truck shipments for a total of 1,132 tons. During the third week of April, 5,400 tons of ore were delivered.

Legislation has been proposed to extend the government purchasing program for strategic minerals to June 30, 1968, including the reopening of the Wenden depot. At this writing, however, the bill has not been passed.



The Phoenix engineering firm of Headman, Ferguson and Carollo has been retained by Inspiration Consolidated Cop-

per Company, Inspiration, Arizona, to make the engineering studies for its mill rebuilding project. The mill is to be completely rebuilt and re-equipped with modern machinery at an estimated cost of over \$3,500,000. About 18 months will be required for the work.

Uranium Corporation of America, in partnership with Standard Ore and Alloys Corporation, has launched a large-scale drilling program on its properties in the Sierra Ancha Mountains of Arizona. Standard is drilling the claims to block out uranium ore in sufficient quantities to merit construction of a concentrating mill in which Uranium Corporation would have a 25 percent interest. Standard is reported to have a controlling interest in Lehigh Valley Coal Company.

The dispute over the closing of the 13,152-acre Sierra Ancha Experimental Forest about 40 miles north of Globe, Arizona, to mineral prospecting has led to the reexamination by the forest service of its program for the area. As a result about 4,600 acres or roughly 34 percent of the area has been returned for prospecting. The withdrawal notice now covers about 8,600 acres in the Tonto National Forest. The Arizona Uranium Ore Producers Association, formed to represent the miners in the dispute, expects law suits to be filed, based on the contention that claims in the area were located prior to questionable legal notice published in the Federal Register by the forest service. The latter's view is that the Sierra Ancha was set aside in 1932 for forestry experimentation in a study of water yield and erosion control.

The Cash mine, 12 miles south of Prescott, Arizona, is shipping ore to Humboldt, Arizona, for treatment when the Poarch plant is put in operation later this year. The ore carries values in gold, silver, copper, lead and zinc. The mine is owned and operated by E. R. Dickie of Bagdad and Jack Orr of Prescott.

The Shamrock Mining Company has filed on 109 claims in the Castle Hot Springs district of Maricopa County, Arizona, and thereby created a new case of "uranium fever." Principals in the Shamrock company are Gene Doyle and Kenneth H. James, both of Phoenix.

The new milling plant of the Tungstona Mining and Milling Company, Bagdad, Arizona, is operating regularly on a three-shift basis. Daily capacity is 200 tons. The ore comes from the company's Tungstona mine where extensive development work was in progress during mill construction. The shaft was sunk to a depth of 300 feet below the adit tunnel and levels run in preparation for ore production. R. C. Bogart is general superintendent.

The Interstate Mining and Exploration Corporation of Nevada has purchased claims in the Sierra Ancha mining district of Gila County, Arizona for \$25,000. Included in the transaction are 10 claims purchased from S. L. Bennett and Willard Haywood.

The Golden Crown Mining Company is reopening the old Orphen Point mine in the depths of Arizona's Grand Canyon, 1,300 feet below the rim, where the firm hopes to find uranium. Golden Crown recently acquired the mineral rights to the property from the owner, Don P. Hogan, who developed the property about 50 years ago. The new firm



## Potash Firm Builds Huge Underground Ore Bin

Located more than 1,000 feet below the surface is this huge new ore bin of Potash Company of America at Carlisle, New Mexico, which is expected to speed up the amount of ore being mined in any one 24-hour period by smoothing out the flow of ore from the ore packets beneath the No. 1 skips. Until now, these packets had to be emptied frequently during shift changes before new ore could be dumped in. Ore will continue to flow from the majority of faces by using track haulage, but ore from the east body will be dumped into the bin by what will be the world's longest underground conveyor belt when it is completed. The bin is 110 feet long, 55 feet deep, and 30 feet wide at its widest point. It was cut out of salt with continuous mining machinery. Ore removal will be by means of a rotary plow feeder, and PCA engineers believe it is the first time one has ever been used below ground. Ore flow will be regulated by varying the speed of the rotating arms. In the photo above, the tremendous size of the ore bin can be clearly seen. In the center at the top of the ladder is a tugger drift. At right is a 10 R.V. undercutter which was used to trim the bin edges to close tolerance before installation of heavy beams and steel plates. The rotary plow feeder now occupies the drift where the undercutter is shown.

plans to build a 2,000-foot tramway to provide access to the claim.

Fred D. Schemmer of Prescott, Arizona has resumed shipments of copper ore from the Commercial mine southeast of Skull Valley. The Commercial was a consistent producer during World War II, and immediately following, when ore was sent to the Clarkdale smelter. The mine is owned by Phelps Dodge Corporation and is operated under lease agreement by Schemmer.

The Pessin mill, nine miles northeast of Morristown, Arizona, has been acquired by L. J. Marchese of Phoenix, Arizona. Marchese has organized the Arizona Tungsten Milling Company to operate the plant. The mill includes screen classification to eliminate the fines, then tabling followed by flotation. It has a daily capacity of 40 tons. Lee Boyer of Tempe, Arizona, has served as consulting metallurgist in revamping the mill flowsheet. Arnold Johnson of Mesa is mill superintendent.

R. A. Croxton and E. M. Guthrie, operating as the Sunset Mining Company, Globe, Arizona, have started work at the property of the Stanley Butte Mining Company. Ore mined during preliminary work at the main shaft is being stockpiled. Plans call for opening the tunnel workings at a later date.



Lee R. Stokes of Quincy, California has sold his leases and property on 2,960 acres 17 miles northwest of Quincy to the Uranium Combined Metals Company of Sacramento, California. Diamond drilling has started.

The Salt Lake City, Utah branch of the United States Atomic Energy Commission announces that it has suspended its aerial spotting program for possible uranium "hot spots" in Kern County, California. The AEC said it would discontinue until further notice posting of monthly anomaly maps. Meanwhile, the U.S. government opened up the Kern River Canyon lands in Kern County for mining claims. This land had been withdrawn for power development purposes. A large part of the Miracle mine property is believed to be in this area.

MacAfee & Company, consulting engineers, have been awarded the contract for the engineering, design, and construction of a new 100-ton-per-day tungsten concentrator for the Tyler Ranch Tungsten Mine of Gold Shares, Inc. near California Hot Springs in Tulare County, California. MacAfee & Company recently moved its offices to 3105 Wilshire Boulevard, Los Angeles, California. Expanded facilities will provide testing laboratories, and additional personnel to handle all phases of mine examination, geology, drilling, metallurgy, plant design, erection, and management of mining properties.

Huntley Industrial Minerals Inc. has added a new primary and secondary crushing section to its nonmetallic mill at Laws, California, along with a new rubber belt conveyor system. The belt conveyor replaces a metal bucket system and is self-cleaning.

JULY 1955

New Idria Mining & Chemical Company has shipped its 500,000th flask of mercury from its mine at Idria, California at current production rates. The company is actively exploring the 60 to 70 percent of its property that has not yet been worked. Exploration results are good. New Idria is also expanding into the tungsten field and uranium fields. Production has started from the Strawberry tungsten mine near Big Creek and the firm has recently acquired some uranium land in Colorado.

St. Anthony Oil Corporation of Los Angeles, California has taken a 1,000-acre bloc in the Shale Hills area of Kern County, California, 60 miles northwest of Bakersfield. The land is owned by Theodore F. Twisselman, and was taken on assignment from E. A. Anderson. An extensive core hold drilling program for uranium will get underway immediately.

Among the many recent reports of uranium strikes in California are those made by the following: Lt. Commander John I. Payer, Lt. Commander Hubert L. Ofer, Lt. C. F. Harms, and Max Hoff, all of the Oxnard area, on 1,200 acres in the foothills west of Ojai. Irvin Mandel, Sid Marks, Jack Kreiger, Bob Titus, and Don Coyne, all of the Los Angeles area, on 16 claims covering 320 acres in the Clark Mountains east of Baker, California. George Taylor and Floyd Wright on four claims covering 80 acres on government land six miles southwest of Indio.

Mule Mountain Minerals, Inc. has been formed by Walter D. Scott of Blythe, California and associates to develop 25 uranium claims in the northern end of Mule Mountain, four miles south of Black Rock. Other members of the firm are Rex McCartney, Roger Walch, and Roy E. Jones.

Kaiser Aluminum & Chemical Corporation has purchased 353 acres of dolomite bearing property adjoining its Chemicals Division plant site at Natividad, Monterey County, California. This extends the company's holdings in Monterey and San Benito counties to about 750 acres including both operational areas and dolomite reserves.



Magnet Cove Barium Company is building a 175-ton barite mill on its property adjoining Battle Mountain, Nevada. The firm recently acquired additional property near Battle Mountain making their potential greater. Ore will be brought from the Graystone mine leased from Dyer, Lee, Hand, and Layton. At present the barium is hauled 42 miles to a crushing plant at Beowawe, Nevada, and then shipped to California for refining.

The Cal-Vada Mining Company is drilling on 75 uranium claims in the Bald Mountain district of Nevada. George Richardson and Bill Lotta of Marysville, California were the original discoverers of the property.

The B.J.V. Mining Company of Reno, under the direction of L.V. Butcher, president, is stockpiling tungsten ore from the Western Soldier Extension near M.G.L. mine. The company is working a three-foot-wide vein of ore on a lime



A hole  
every 3 minutes

AIR DRILLING PATTERN  
HOLES WITH

**HAWTHORNE**

"Blue Demon"

**INSERT  
ROCK BITS**

All-formation rock bits in fractional sizes from 1 1/4" through 6 3/4" for SHOT HOLE • SLIM HOLE • MINERALS EXPLORATION • STRATIGRAPHIC • CORE HOLE and WATER WELL DRILLING

U. S. PATENTS  
2,615,684  
2,655,622  
OTHERS PENDING



Actual drilling experience using 4 1/4" Hawthorne Insert Rock Bits on 20-foot pattern holes on the West Texas Plateau.

WRITE FOR ILLUSTRATED CATALOG

**HERB J. HAWTHORNE**

INC.

P. O. Box 7388 • Houston 8, Texas



granite contact containing, in addition to scheelite, garnet, quartz, calcite, and clinozoisite. The firm is also drifting on a streak of tungsten ore on the nearby *Juniper* claim.

The *Acme Mining Company* of Reno is operating a new 50-ton tungsten mill on the east side of Winnemucca lake bed. A.R. Culver of Reno is milling tailings for the M.G.L. mine near Nightingale and plans call for doubling the present mill capacity and handling custom ore in the near future. Mr. Culver is also opening up a new tungsten property south of the M.G.L. mine, the "P and S" property which reportedly shows ore of over 1.0 percent WO<sub>3</sub> and appears promising.

H. W. Gould Company of San Francisco is developing the *Lucky Day*

uranium mine consisting of over 30 claims situated 13 miles northeast of Nixon, Nevada. The ore occurs in fractures in a volcanic rock in the form of minute crystals of carnotite. Over 300 feet of drift has remained in low grade ore. Five men are employed.

*Pioche Manganese Company* has closed down its electric furnace operation at Henderson, Nevada, and is negotiating the transfer of facilities. The Pioche firm has been supplying a part of the western market with ferro-manganese and silico-manganese. Several firms are believed to be interested in taking over the operation, and continuing the production of ferro-alloys with the power allotted to the plant.

The uranium claims of C. B. and K. F. Hanson 12 miles northeast of Yerington,

Nevada have been incorporated as the *Yerington Uranium and Drilling Corporation* after a favorable investigation of the property by officials of the Atomic Energy Commission. The Hanson brothers have already spent \$5,000 on the property since it was first located almost a year ago. The property covers 10 claims totaling 200 acres. Since this original discovery many other claims have been staked around it and the district has become extremely active. First work of the new firm is to drill the property.

NEW MEXICO

*Petaca Mining Company* has started work at its Rio Arriba County, New Mexico property where it will produce mica and rare earth minerals. A Diesel power plant has been installed to provide electricity for the mill and other installations.

*Moab Drilling Company*, a Charles Steen venture, is reported to be completing negotiations with *Col-U-Mex Uranium Corporation* to explore about 20,000 acres of New Mexico school land, held by Col-U-Mex under prospecting permit. Moab Drilling would provide the money for the project, and would receive a 60 to 75 percent interest in any ore discovered.

*Elayer Company Inc.* of Silver City, New Mexico has started stripping operations on uranium land owned by the *Tovrea Land and Cattle Company* of Phoenix, Arizona, in the White Signal Mining district. A 50-ton car of ore was shipped early in May.

A uranium rush in Grant County, New Mexico, was accelerated recently with filing of location notices on 36 claims in the Black Range area and in White Signal district by Wm. Soehle, Silver City merchant, and Richard Cureton, Hidalgo County rancher. The Duke d'Atri, a French nobleman, also announced that he had filed on 9,000 acres for uranium prospecting in Arizona. The Duke and Duchess d'Atri have been developing uranium-bearing claims in the White Signal district, shipping ore to the Anaconda mill at Grants.

*Santa Rosa Uranium Company*, with holdings in Guadalupe, Lincoln, and San Miguel counties in New Mexico and Garfield County, Utah, has been incorporated with headquarters at Santa Rosa, New Mexico. Officers are Ira W. Smith, Manuel C. Medley, and Keith Kivlehen. *Capitan Pass Uranium Company, Inc.* has been chartered at Carriazo, New Mexico, with J. C. Garrison, F. V. Guest, and R. T. Lemay as incorporators. Other new firms include: *Bolivar Uranium Corporation* at Albuquerque by W. E. Taylor, Jr., R. E. Moore, and J. Rodgers; *Amuranium Company* at Grants by E. E. Boyles, M. R. Hall, and M. P. Garouch; *Lucky Strike Uranium, Inc.* at Albuquerque by H. Wells Kilbourne, Lyn Cummings, and Isabell Cummings; *The Fourteen Group, Inc.* at Albuquerque by P. S. Watkins, M. D. Rueckhaus, and C. L. Olin.

Send for FREE  
CATALOGAN  
IMPORTANT NEW  
SUPPLIER OF

diamond drill bits

It will pay you to consult the new D.T.R. Drill Bit Catalog before purchasing another diamond bit.

D.T.R. gives more diamond value per dollar, skillful selection and mounting of stones, the right matrix for the job, individualized resetting and fast delivery on new bits and resets.

Even more important is that you get bits made by diamond specialists. D.T.R. is successfully and exclusively engaged in every aspect of industrial diamond product fabrication. It is this broad knowledge that assures you of substantial drilling economies through reduced footage costs.

Don't delay . . . write for your D.T.R. Catalog today!

DTR

DIAMOND TOOL RESEARCH CO., INC.

Dept. C7 380 Second Avenue, New York 10, N. Y. GRamercy 5-3530

"Quality Industrial Diamond Products Exclusively"

DIAMOND TOOL  
RESEARCH CO., INC.  
Dept. C7  
380 Second Avenue  
New York 10, N. Y.

- ☐ Please send me your new Catalog  
☐ Please have your representative call to discuss our drilling problems

Name .....  
Title .....  
Company .....  
Address .....  
City ..... State .....



## M. A. Hanna To Open New Minnesota Iron Ore Mine

The M. A. Hanna Company will open a new mine known as Parcel 3 near Coleraine, Minnesota, located between the King and Canisteo mines, about one mile from the old Buckeye mine which Hanna closed last year.

Stripping and construction will be undertaken this year, with ore production scheduled to start in 1956. A new washing, heavy media, and cyclone plant will be constructed. Planned beneficiation capacity is 500,000 to 1,000,000 tons annually.

Arthur G. Nelson, former superintendent of the Buckeye, will take charge of the new mine.

## Freeport Sulphur To Mine Underwater Deposit

Freeport Sulphur Company will install facilities to mine sulphur from a newly discovered salt dome deposit in the Louisiana tidelands. Known as Lake Pelto, the deposit is located near the Bay Ste. Elaine mine about 60 miles southwest of New Orleans.

Prospecting operations were started early this year, and drilling has progressed to the point where it has been decided to install facilities for mining the property. Located beneath six to eight feet of water, it will be the first of the company's sulphur properties which is entirely underwater and will involve new and difficult engineering and development problems.

## C&H May Terminate Michigan Copper Project

Calumet & Hecla, Inc., board of directors gave president Endicott R. Lovell authority to terminate all or part of the company's holdings at Calumet, Michigan after efforts at settling a labor strike met with no success. They also authorized him to liquidate its assets and recommend to the board profitable other uses for the division's working capital and funds obtained from the sale of assets.

The company is suing the union for \$3,500,000 damages, claiming the strike was illegal. According to the firm, union officials failed to give notice of the strike, failed to notify the Federal Mediation and Conciliation Service and the Michigan Mediation Service as required by the National Labor Relations Act, and, furthermore, the men left molten metal in the furnaces when they walked off the job.

The company has been producing copper in upper Michigan Peninsula since 1859. Recent operations have been concerned with dewatering the Osceola Lode.

state-owned land. Applications were received under the wildcat iron ore law covering lands which are located near Littlefork, Koochiching County, where uranium prospecting is under way. If permits are issued under this law, they are for iron and other minerals, and apply to all counties in the state except St. Louis, Itasca, Lake, Crow Wing, and Fillmore. Plans are being made to process permit applications for uranium specifically.

Fire of undetermined origin destroyed the Mifflin Mining Company mill at Mifflin, Wisconsin. Estimated loss is between \$100,000 and \$150,000. The fire apparently started from defective wiring or from sparks dropped during welding operations. Plans are now being made to rebuild the mill.

The Piquette Mining and Milling Company of Platteville, Wisconsin started operation of its new 300-ton, gravity-flotation, zinc-lead mill at Tennyson on May 2.

The Cuba Mining Company of Platteville, Wisconsin has purchased the 100-ton mill of the Homestead Mining Company, also at Platteville, and plans to move it to the firm's ore body near Mineral Point.

Recent uranium firms formed in North Dakota include the following: *Fort Union Mining and Exploration, Inc.* with headquarters at Mandan, by I. Wilbur Annear of Medora, Dale L. Hennegar of Bismarck, and Arthur R. Brazda of Mandan; *Grubstakers Inc.* of Grand Forks, by Howard L. Waldron, Arthur W. Kothwin, Harold Hagen, Dean R. Mikkelsen, and John Ingvalson, all of Grand Forks; and *Hettinger Company, Inc.* of Hettinger, by Hugh S. Hasche, Raymond B. Linquist, N. R. St. Marie, Thomas D. Stevens, and James Clement, all of Hettinger.

Drill-hole logs and maps of mine workings in the Tri-State zinc-lead district are being compiled by the U.S. Bureau of Mines and made available to interested persons at the Bureau's office at Ironton, Missouri. Progress of the undertaking, which was started in 1949, is described in a report just released. As of May 1, 1954, about 28,000 drill-hole logs had been microfilmed and the work of recording and microfilming additional holes is continuing. Eventually, it is planned to cover the explored and mined tracts in 760,000 acres of the more active western part of the district. Mined areas and locations of drill holes are being recorded on standard half-section maps, of which 63 have been completed and indexed.

EASTERN STATES

Increasing capacities for production of aluminum are in the planning stage. *St. Joseph Lead Company* and *Pittsburgh Consolidation Coal Company* have asked the Office of Defense Mobilization for approval to construct an \$85,000,000 aluminum plant in Pennsylvania with steam-generated electricity using coal as fuel. They have asked ODM for a five-year depreciation of the plant which would produce up to 66,000 tons of aluminum ingots a year. *Reynolds Metals Company* reports plans to construct a 25,000-ton facility possibly at Sheffield, Alabama.

*Pacific Tin Consolidated Corporation* has organized a subsidiary, the *Feldspar Corporation*, to take over the assets of the four feldspar companies it acquired earlier this year. (See *MINING WORLD*, March 1955, page 89.) *Feldspar Flotation Company* at Spruce Pine, North Carolina, *Feldspar Milling Company* at Bowditch, North Carolina, and *North Carolina Feldspar Company* at Erwin, Tennessee will be dissolved. For awhile, the fourth company—*Appalachian Feldspar Company* at Monticello, Georgia—will continue to operate under its own name, but this, too, will eventually be dissolved into the Feldspar Corporation. Officers of the new subsidiary are Norman Cleaveland, president; F.S. Miller, executive vice president; Carroll P. Rogers, Jr., vice president; Glenn Blevins, secretary-treasurer.

The *Carborundum Metals Company* of Akron, New York, has reduced prices of zirconium by as much as 40 percent. Commercial grade zirconium ingots of 500 pounds and over has been cut to \$14.40 a pound from \$22.00. Similar reductions were made in the low hafnium grade metal, with reactor grade sponge formerly \$22 a pound, now cut to \$14. Low-hafnium ingot was reduced to \$23.07 a pound from \$33. The company, a subsidiary of *Carborundum Company*, said the price reductions were made possible by the firm's ability "to reduce the cost of the basic metal, the selection of well qualified fabricators, and particularly the ability of these fabricators to increase their yields of acceptable, on specification, material."

Experimental removal of manganese from steel slag proved unsuccessful at the pilot plant of *Mangaslag, Inc.* at Coxton

Minerals Purchases Through 31 March 1955 Under Government Purchase Plan For Domestic Minerals and Total Authorized Purchases

Mineral	Through 31 December, 1954	Through 31 March, 1955	Total Authorized
Beryl <sup>1</sup>	557	676	1,500
Chrome ore <sup>1</sup> and concentrate	77,399	82,402	200,000
Columbium-Tantalum <sup>2,3</sup>	7,554,279	9,084,159	15,000,000
Manganese <sup>4</sup>			
Ruthe-Phillipsburg	1,418,058	1,440,006	6,000,000
Deming	2,213,221	2,307,346	6,000,000
Wenden	5,820,542	5,406,208	6,000,000
Carbond	2,275,617	2,725,306	19,000,000
Tungsten Trioxide <sup>4</sup>	1,460,051	1,677,453	3,000,000
Mercury <sup>4</sup>	None	None	125,000

<sup>1</sup> Short tons.

<sup>2</sup> Foreign and domestic.

<sup>3</sup> Pounds.

<sup>4</sup> Long dry ton units.

<sup>5</sup> Short ton units.

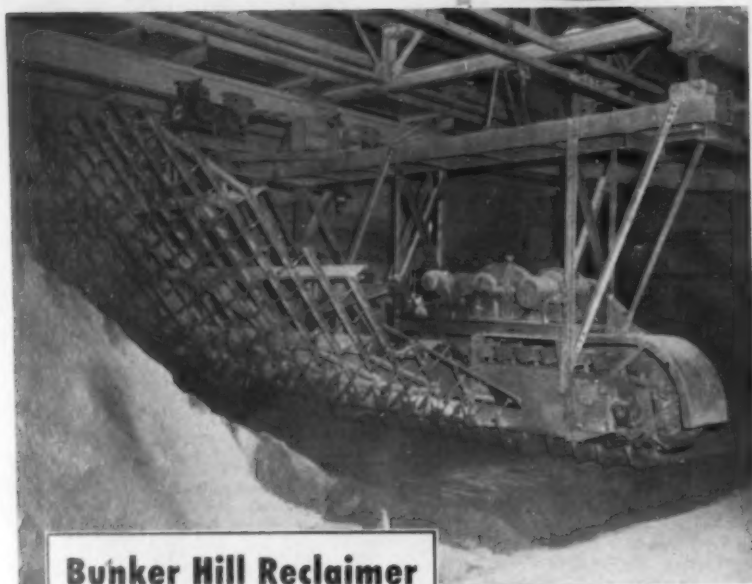
<sup>6</sup> Flasks.



Minnesota state officials are considering the problem of issuing prospecting permits and mining leases for uranium on

# A Better Reclaimer

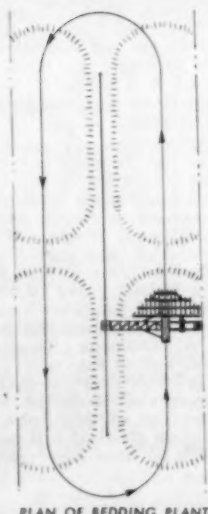
**COSTS LESS  
IMPROVES  
PERFORMANCE**



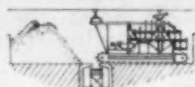
**Bunker Hill Reclaimer**

Achieves complete uniformity of preparation charge and is fully automatic. Operates to full capacity of subsequent flow sheet. Stearns-Roger engineered design saves weight for lower first cost. One machine serves any number of tandem bedded piles, each 30' wide. The unit shown at Bunker Hill & Sullivan's Kellogg custom lead smelter has a rated capacity of 150 t.p.h. on minus 1/4" material weighing 110-125 lbs. per cu. ft. with 2-10% moisture. This Reclaimer has operated as high as 200 t.p.h. for sustained periods. Over 15 months' initial operation is reported highly satisfactory.

*These same features can cut costs for you. Write for complete data and price.*



PLAN OF BEDDING PLANT



ELEVATION

# Stearns-Roger

THE STEARNS-ROGER MFG. CO. DENVER, COLORADO

DENVER, SALT LAKE CITY, HOUSTON, EL PASO  
STEARNS-ROGER ENGINEERING COMPANY, LTD., CALGARY

## CENTRAL AND EASTERN

Yards, Duryea, Pennsylvania. The plant has been shut down and is now under the supervision of the General Services Administration.

First shipments have been made from Lithium Corporation of America's new plant at Bessemer City, North Carolina.

Electro Refractories & Abrasives Corporation and Strategic Materials Corporation plan a joint operation of Spar-Mica Corporation Ltd. of Montreal, Quebec. The partnership of the two Buffalo, New York firms would be for mining, processing, and marketing of feldspar, mica, and other industrial minerals. Spar-Mica, a sub-subsidiary of Strategic, plans to erect a new dock on the St. Lawrence Gulf as soon as possible. Designed to berth 10,000-ton cargo vessels, the pier is to be ready for use late this summer. Mining equipment and milling facilities will then be installed to produce 300 tons of feldspar concentrate daily. The Spar-Mica feldspar and mica deposits are located on tide water. The firm also owns pegmatite deposits in Quebec.



Reserve Mining Company has placed its huge new gyratory crusher in operation on a trial basis for the first time. Built by Allis-Chalmers Manufacturing Company, it is said to be the largest of its kind. The crusher will be used to crush taconite rock from run-of-mine sizes down to minus-four-inch at the company's operations at Babbitt, Minnesota. The crushed taconite will then be moved by rail to the company's Davis Works at Silver Bay for further crushing, milling, separating, and agglomerating into taconite concentrate pellets.

Production in general on the Mesaba Iron Range is stepping up to a very fast pace as many of the plants have gone to a three-shift, six-day production week with repairs being made on the seventh day. Production quotas for most properties have increased several times since the opening of the season. If the present rate of operation continues, it seems likely that the year's tonnage will approach 1953's record high of 96,000,000 tons.

Rhude and Freyberger are in the process of adding a washing plant to their present crushing and screening plant at the Trou mine near Eveleth, Minnesota. They will operate the Troy and Boeing mines this season but do not have any shipments scheduled from the Pennington on the Cuyuna Range.

Reserve Mining Company has established a fellowship in economic geology and petrography at the University of Minnesota, which will provide \$3,500 for 12 months to a graduate student with at least a master's degree and trained in research in mineralogy and petrography. The scholar must work for a Ph. D. under the supervision of the Minnesota Geological Survey and begin field work on the stratigraphy of the taconite area of the Mesabi Range. Applications can be filed with the chairman of the geology department at the University of Minnesota.

## Sun Dog Mine Sending Ore To Riverton Buying Station

First uranium property in the Crooks Gap area of Fremont County, Wyoming to begin shipping ore to the U.S. Atomic Energy Commission buying depot at Riverton was the Sun Dog mine, jointly operated by the Crooks Gap Mining Company and the Split Rock Mining and Exploration Company.

The mine is owned by Bob, Norman and Andy Harrower of Pinedale and Kemmerer, Wyoming, and associates, and is reported to give promise of being one of the richest in the state. Seven ore horizons have been opened up on the face of the mountain on the claims, and the bulk of the company's holdings remain to be explored. Ore beds vary in thickness from a few inches to nearly five feet, with each vein widening as excavation work progresses. No assays have been received on shipments to the AEC buying depot, but they are believed to run about 1.0 percent.



Seven Colorado Plateau uranium companies are considering a merger which would result in the formation of *Midwest Consolidated Uranium Corporation*. Involved in the proposed transaction are *Allred Uranium Corporation*, *Blue Mountain Uranium Mines, Inc.*, *Geronimo Uranium Mines, Inc.*, *Henry Mountains Uranium Corporation*, *Midwest Uranium Company*, *Wildcat Uranium Corporation*, and *World Uranium Corporation*. Six uranium mines from the above group are now operating and one is being readied for operation. Most of the properties are located in Colorado and Utah.

Nineteen uranium claims on Uranium Peak, 17 miles northeast of Meeker, Colorado, have been purchased by *Gulf Coast Western Oil Company*, Oklahoma City, Oklahoma. The claims were sold for \$350,000 by the Devereaux brothers and F. A. Brown and cover approximately 382 acres. The property has been under development for the past four years, and approximately 1,000 tons of uranium-vanadium ore have been shipped from the claims to the AEC's Rifle, Colorado mill in the past two years. Ore is in the Salt Wash member of the Morrison formation. Claims are located at a 9,300-foot altitude and reportedly can be operated eight months out of the year. The firm also made a strike of high-grade ore late in May in the Coal Creek Tunnel and has begun shipping ore from that operation. F. R. Henson is president of the Oklahoma firm which has set up a uranium division office in Meeker. R. E. Moller of Idaho Springs, Colorado, is in charge of mining operations.

*Four Corners Uranium Corporation*, Denver, Colorado, has announced a major uranium discovering in the foothills near Morrison, Colorado. The deposit, in the Morrison Hogback formation, was found by two prospector brothers, Stanley H. and Robert Stauss of Cripple Creek. Extensive core drilling, which brought sample assays as high as 1.66 percent U<sub>3</sub>O<sub>8</sub>, has encouraged the

company to begin development work. The Stauss brothers, who had leased the 1,100-acre property and then sold option rights to Four Corners, will conduct mining operations on a lease from Four Corners. Work on sinking a shaft has started and is expected to be finished by the end of this month.

*Idaho Maryland Mines Corporation*, California gold producer, has begun shipping uranium-vanadium ore from its Colorado property, located halfway between Grand Junction, Colorado, and Moab, Utah. The firm has approximately 1,200 acres under lease in Colorado and Utah. Initial shipment was 11 tons.

*New Idria Mining and Chemical Company*, California mercury producer, has announced the acquisition of 1,120 acres of uranium property in Mesa and Grand counties, Colorado. Located on Beaver Mesa near Grand Junction, the land was purchased from a San Antonio, Texas engineer for more than \$1,000,000 in cash and New Idria stock. Core drilling exploration work on the property, which has been actively mined since 1951, is now underway.

The likelihood that the Rifle, Colorado Oil Shale Demonstration Plant operated by the U.S. Bureau of Mines will remain open one more year has become greater with a recommendation by President Eisenhower to appropriate \$1,250,000 to continue the plant. Approval must still be obtained from Congress to continue operation of the plant. The Department of the Interior had originally recommended that the plant be closed June 30, but a later recommendation by the Budget Bureau to the President stated that further research at the project was desirable. It is believed that this will be the last year that the plant will be in operation, due to plans of the *Union Oil Company of California* to erect a similar plant of its own in the area. (See MINING WORLD, April 1955, page 79 for details.)

*Moab Mines, Inc.* announced the discovery of a new ore roll including a high-grade ore log in the company's

*Lucky Nine* uranium mine in Montrose County, Colorado. The find is 30 feet from a blocked-out ore body which is the present target for the mine's Number Three drift. Full length of the log has not yet been determined, but W. F. Jamieson, chief mining engineer for Moab Mines, states that approximately 3,000 pounds of high-grade ore have been extracted. All ore is being stockpiled on the premises.

*Stearns-Roger Manufacturing Company*, Denver, Colorado, has been named as engineering and contracting firm for the *Union Oil Company of California's* \$5,000,000 pilot shale oil extraction plant in northwestern Colorado. Construction is expected to start this summer with plant completion scheduled for next year.

*Chesapeake and Colorado Uranium Corporation*, Grand Junction, Colorado, is making its first offering of common stock to the public. The company is the outgrowth of a partnership organized in 1953 by Francis M. Tomkins and Joe D. Farris and has nearly 300 claims covering 6,000 acres in southwest Colorado and the Moab area of Utah. Chief engineer for the firm is Lytle Brown, Jr. Chief geologist is Maxwell R. Sartain, petroleum and mining geologist and aerial photographer. Mr. Tomkins is president of the company.

*Consolidated Ranwick Uranium Mines Limited*, a Canadian associate of *Ventures Limited*, has opened offices in Denver, Colorado. General mineral exploration will be handled by the office staff under the direction of Thomas W. Mitcham, exploration manager.

Three core drilling contracts have been awarded to *Mott Core Drilling Company* of Huntington, West Virginia and Grand Junction, Colorado by the *United States Atomic Energy Commission*. Located on the Colorado Plateau, the work will involve 113,000 feet of drilling. Programs will be conducted in Montrose and San Miguel Counties, Colorado; Deer Flats, Utah, and a roving contract in various



## Paramount Ships from Montezuma Canyon Mine

*Paramount Uranium Corporation* of Moab, Utah has begun shipping ore from its mine in Montezuma Canyon, San Juan County, Utah. In the above picture miners Frank Hoyle (left) and Bob Henry (right) shovel ore into a truck for the company's first shipment to the *Vanadium Corporation of America* mill in Durango, Colorado. The first load had a net weight of 19,660 pounds. Paramount purchased the mine and eight claims known as the Shumway group from Mr. and Mrs. Seth Shumway of Blanding, Utah, last winter. The mine had produced more than 1,000 tons of uranium-vanadium ore before it was sold by the Shumways.



This  
is

## SELECTIVE



## OPEN PIT MINING

Isbell experience in volume earth moving and selective open pit mining is long established... has moved over 200 million tons.

Isbell teams have successfully mined or stripped copper, gold, lead, sulphur, manganese, tungsten, uranium, zinc, and non-metallics.

Isbell has available the equipment, engineering, management, and operating personnel for jobs anywhere.

**ISBELL**  
CONSTRUCTION COMPANY

BOX 2351 RENO, NEVADA TELEPHONE 2-7150

### ROCKY MOUNTAIN

parts of Colorado, Utah, and Arizona. The company recently purchased a new Cessna 180 plane to help in the supervision of its various drilling contracts.

A new uranium corporation has been set up to mine claims in Montezuma County, Colorado. President of the new group is O. R. O'Bannon, Odessa, Texas oil man. The company will operate 78 claims in Cross Canyon south of Dove Creek. These properties were acquired from a large group of Durango prospectors.

### SOUTH DAKOTA

Sodak Uranium & Mining Company, Inc. has acquired the Phillips ore body in Fall River County, South Dakota, and shipments are expected to begin this summer. The company also recently bought an option on 21 contiguous lode claims in the Lignite area of South Dakota's Custer National Forest. Sodak has additional uranium claims and operating properties in Wyoming and is studying plans for a uranium processing mill to meet milling problems encountered in the Lignite area.

### UTAH

Moab Uranium Corporation and New England Uranium & Oil Company have jointly purchased seven uranium properties in Utah. Five of the properties in San Juan County have produced ore, another San Juan group is being opened for mining, and drilling is underway at the other property, in the Henry Mountains. All will be operated by the two firms under a cooperative agreement. Sellers included C. C. Cope and associates, Mr. and Mrs. Pete Shumway, H. W. Balsley, Mr. and Mrs. E. L. Christensen, Mr. and Mrs. Ivor Adair, Mr. and Mrs. William T. Hines, and Mr. and Mrs. Merle D. Lloyd, all of Moab, Utah.

An extensive drilling program is being conducted by *Utaco Uranium Inc.*, Moab, Utah, on its 132 claims in San Juan and Grand counties Utah. Drilling is under contract to an *Atlas Uranium Corporation* crew, which was scheduled to drill the *Evening Star* claims in Indian Creek district, *Utaco's Lisbon Valley* claims, and the *Carpenter Ridge* properties of the firm, which adjoin holdings of *Consolidated Uranium Corporation*.

*Norbute Corporation* has purchased the operating interest in the *Ringtail* uranium mine, a 640-acre property in the Yellow Cat area of the Colorado Plateau. The mine, 17 miles south of Thompson, Utah, was originally drilled by the *United States Geological Survey*, and current operations are being carried on in the area indicated by this drilling. Nicolas M. Solgo is president of *Norbute*. L. L. Steindler, vice president, oversees company operations from Grand Junction, Colorado.

*American Sulphur & Refining Company's* 100-ton per day refining plant at

I'M SOLD  
ON



Kleenslot

### WEDGE WIRE SCREEN GUARDS

They're Rugged, Dependable, and give Long Life Performance

The screen guard is built into the screen and the guard bars permit only the finer particles to pass over the screen. This item can be furnished in special sizes to your requirements in practically any type of long wearing metal.

Complete literature is available. These screen guards are non-dragging, non-blinding, and are strong, rigid, uniform and extremely economical.

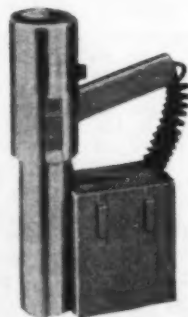


**Wedge-Wire**  
CORPORATION

Gas Street at Nickle Plate R. R.  
Wellington, Ohio

### SCINTILLATION COUNTERS

FIND URANIUM 100 TIMES EASIER



MODEL 111 (pictured above) . . . \$495.00  
FAMOUS WALROSS MODEL 939 . . . 975.00  
AIRBORNE OPTIMUM MODEL 5AB-7 . . . 2810.00

ALL TYPES GIEGER COUNTERS  
ULTRA VIOLET LIGHTS  
SPECIAL LONG PROBE SCINTILLATION AND  
GIEGER COUNTERS FOR DRILL HOLES

ENGINEERS SYNDICATE, LTD.  
5011 Hollywood Boulevard  
Hollywood 27, California  
OLympia 2167



Sulphurdale, Utah is now in operation. The plant employs a new sulphur refining process developed by the firm to extract sulphur from low-grade surface ores (See MINING WORLD, November 1954, page 98, for details). The company has leased 7,000 acres at Sulphurdale, and the deposits, known locally as the "Cove Creek Deposits" to date have proved ore of 3,900,000 tons. Marketing of the refined product will be handled through Balfour-Guthrie Company Ltd.

Stockholders of Standard Uranium Corporation and Big Indian Mines, Inc. have voted to merge the two Utah firms. The boards of directors of the companies had approved the merger earlier this year. Standard reports shipments ranging from 400 to 600 tons of uranium ore per day from its Big Buck claims in San Juan County, Utah. Properties of both companies are adjacent to Charles Steen's Mi Vida mine, southeast of Moab.

Atlas Corporation, New York, is reportedly interested in constructing two uranium processing mills, one near Moab to handle ore with high lime content from deposits developed in the area north of Moab, and one near Greenriver, which would process ores from the Hidden Splendor mine of Atlas as well as other producing mines in the area. A proposal to operate the Greenriver mill by nuclear power has been suggested to the Atomic Energy Commission by Atlas.

Alabama-California Gold Mines Company has obtained lease on a block of claims in Coal Wash Canyon west of Temple Mountain, Utah, as well as claims in the Green River and Millard Canyons. The claims were obtained from Frontier Uranium and Emata Exploration Company, Inc. in return for a block of Alabama-California stock and royalty payments of approximately \$550,000. President of Frontier and Emata is Don Murphy of Eatonville, Washington. Bryce Little of Seattle, Washington heads Alabama-California Gold Mines.

A working agreement between Talisman Mining and Leasing Company, Inc., Spokane, Washington, and The Cosmo Company, Denver, Colorado, has been signed to work Talisman's holdings on Temple Mountain, Emery County, Utah. Cosmo is supplying crews, equipment, and living quarters at the property. Assays taken from the property show a  $U_3O_8$  content of from 0.50 to 1.30 percent. A high vanadium content is expected, since the property was a vana-

dium mining operation during the 1940's but had been shut down due to an excessive uranium content. Talisman is headed by Joseph Skorupski, Spokane.

Standard Mining Corporation, a subsidiary of Standard Ore and Alloys Company, has begun a uranium program on the Colorado Plateau, holding claims in Utah, Wyoming, Arizona, and Colorado. At the firm's Joshua group of claims in Emery County, Utah tunnelling has reached 200 feet. Three rigs are deep drilling in the Kanab area where Standard has 3,000 claims, and a deep drilling program is blocking out ore at its Congo properties in Garfield County, Utah.

Allied Uranium Mines, Inc., Salt Lake City, Utah, has applied to the Defense Minerals Exploration Administration for a loan to develop its five uranium properties. Claims belonging to the firm are the Ucola and Pitchblende properties, San Juan County, Utah; Sunlight holdings, San Rafael Swell, Emery County, Utah; three Utah school sections, Cottonwood Wash, San Juan County, Utah; and claims on Monogram Mesa, Colorado.

## WYOMING

The Long Mining Company of Vernal, Utah, has delivered its first load of autinite uranium ore to the Atomic Energy Commission buying station in Riverton from the Sagebrush claims in the Gas Hills area of Fremont County, Wyoming. The ore is coming from deposits near the surface with minimum overburden while testing and development work is proceeding on other deposits on the same claims. The mining is being done in an open pit with a bulldozer.

Production is expected to be resumed this summer on the Sno-Ball claims in the Crooks Gap area of Fremont County, Wyoming. Last year the Cokeville Development Company mined several thousand tons of surface ore from the property.

The Wyoming Uranium Corporation is continuing small production from its

Helen May mine in the Crooks Gap area, Fremont County, Wyoming. Some surface ore is being shipped to the United States Atomic Energy Commission buying station at Riverton during development work. Company president is Hepburn T. Armstrong. Fred Haley is mine manager.

Production at the Hazel mine is continuing at the rate of a truckload per day. The property, owned by Lawrence J. Bergsten, Lander, Wyoming, has been leased to Mountain Mesa Uranium Corporation. The ore is being mined from a surface outcropping, and  $U_3O_8$  content has been reported at from 0.15 to 0.20 percent. An extensive drilling program is also underway at the property. San Juan Uranium Exploration Corporation, Denver, Colorado, is testing the property and will do actual mining under terms of an agreement with Mountain Mesa.

Purchase of 12 uranium claims in the Crooks Gap area of Fremont County, Wyoming, was announced recently by Ray Thompson, president of Mile High Minerals, Inc., Denver, Colorado, who said claims were purchased from Ace Mining Company, Rock Springs, Wyoming. The sellers reserved production royalty ranging from 10 to 15 percent on base price of the ore. A large drilling operation will be undertaken shortly as weather conditions permit, and the initial portion is expected to exceed 10,000 feet. The claims completely surround the Sno-Ball group where 1,000 tons of surface ore was produced last summer.

Another concern began uranium production recently in the Gas Hills area of central Wyoming when Twin Arrow Petroleum Corporation, Denver, Colorado, started shipments to the AEC buying station at Riverton. S. T. Rabourn, Rangely, Colorado, vice president, who is in charge of the operation, said a large pit has been opened on the property and that production will continue at an increasing rate. Located in a dark sandstone, the Twin Arrow ore averages from 0.2 to 0.45  $U_3O_8$ . The company plans an extensive drilling program to further block out its ore bodies.

# Core Drilling by Contract

Exploration for coal and other mineral deposits. Foundation test boring and grout hole drilling for bridges, dams and all heavy structures. Core Drill Contractors for more than 60 years.

**JOY MANUFACTURING CO.**  
Contract Core • MICHIGAN CITY  
Drill Division INDIANA

## URANIUM-TUNGSTEN-MERCURY ZIRCONIUM-ZINC

Prospecting  
Information  
Latest News  
and Data on  
Equipment  
and  
Methods

Ultra-Violet Products, Inc.,  
Dept. W San Gabriel, California

Please send me Prospecting  
information, description of  
equipment available, and name  
of nearest dealer.

Name \_\_\_\_\_  
Address \_\_\_\_\_  
City \_\_\_\_\_ State \_\_\_\_\_

### IF YOU'RE PROSPECTING FOR ANYTHING, YOU NEED AN ULTRA-VIOLET MINERALIGHT

**HERE'S WHY!** The Mineralight shows  
traces of uranium not sufficient to  
excite other responses, and detects  
minerals which are often found  
with uranium ore. By itself or  
teamed with a Geiger or Scintilla-  
tion Counter, Mineralight is a must.

### SEE THE MINERALIGHT IN ACTION

Your MINERALIGHT dealer can demonstrate  
various models for you and give you com-  
plete information on Geiger counters, scintilla-  
tion counters, and other prospecting equip-  
ment, as well as the latest data on uranium prospect-  
ing. See him today or write for valuable bulletin  
—"Uranium Prospecting with Magic Mineralight".

**ULTRA-VIOLET PRODUCTS, INC.**

## Northwest Mining Firm Consolidates Four Groups

A new firm, International Oil and Metals Corporation, has been organized in the Pacific Northwest to operate extensive and varied mining properties. Interests of four mining companies have already been consolidated into the new group, with the acquisition of International Iron Mines Ltd. of Canada; International Metals Corporation of Idaho; Silver Ridge Mining Company Ltd.; and Montana-Arizona Copper Mines of Ajo, Arizona. In addition, the Alabama-California Gold Mines Company is considering a merger proposal.

International Iron Mines owns the Nimkish mine on Vancouver Island. Expenditure of more than \$1,000,000 is planned in the next 12 months to put the property into production and to construct a processing plant. Ore reserves are estimated at more than 2,000,000 tons. Drilling is now in progress and a seven-mile rail line to serve the property is under construction.

International Metals of Idaho, through subsidiaries, operates a dredge for monazite sands containing thorium and rare earths, and holds 4,000 acres of dredging ground in reserve. It also owns a columbite-tantalum property at Garden Valley in Boise County, Idaho. Silver Ridge has a lead-silver-zinc mine near Sandon, British Columbia, and is exploring some uranium claims in Utah.

Board chairman of the new firm is W. Dale Bost, New York investment banker and president of Silver Ridge. Hugh C. Van Valkenburgh of Seattle is president; Harry F. Magnuson, Wallace, Idaho, vice president; C. T. Takahashi, Seattle importer-exporter, is director in charge of foreign operations.

## Idaho Joins List of Uranium-Producing States

Idaho has joined the list of uranium-producing states. First commercial shipment was mined by C&G Mining Company of Cortez, Colorado, from a cut alongside U. S. highway 93, seven miles south of Salmon in Lemhi County. The 11-ton load went to Vitro Chemical Company at Salt Lake City.

The claim from which the ore was taken was staked by Charles K. McConnell, 45-year-old "cat skinner" from Jackson Hole, Wyoming. He found radioactivity on the claim while prospecting with a scintillation counter in snow and near-zero weather in January.

The showing was in the Challis volcanics and had been passed up by numerous persons. An AEC official commented that it was the "last place" he would have looked for uranium.



Radon Uranium, Inc. of Kellogg, Idaho has amended articles of incorporation and changed its name to *Utah-Idaho Consolidated Uranium, Inc.* The firm is the new operating firm for six Kellogg companies which owned a majority of stock in *U&I Uranium, Inc.*, recently merged with *Federal Uranium of Ne-*

*vada*. Wayne Brainard of Kellogg is president, and P. J. Holtz, secretary.

At the *Lucky Friday* lead-silver-zinc mine east of Mullan, Idaho, *Lucky Friday Silver-Lead Mines Company* has raised in excellent ore from the 2300 level to the 2150 level. At last report, more than 100 feet of good ore had been opened by drifting on the new 2150 level. Production is running between 100 and 120 tons daily. John Sekulic is president and manager.

*Sunshine Mining Company* has resumed deep-level development of the Yankee Girl vein in adjoining ground of *Metropolitan Mines Corporation*. The work is on the 3,700 level. Ross D. Leisk is general manager.

At a depth of 1200 feet below sea level, *Bunker Hill & Sullivan Mining and Concentrating Company* has opened lead-silver-zinc ore of as good quality and quantity as on higher levels. The Bunker Hill mine is at Kellogg, Shoshone County. John D. Bradley is company president.

*Sullivan Mining Company*, jointly owned by *Bunker Hill & Sullivan* and *Hecla* mining companies, has liquidated heavy inventories of slab zinc and cadmium at its electrolytic zinc plant near Kellogg. An adjoining sulphuric acid plant, put into operation early last year and shut down last August, was producing at a rate of nearly 100 tons daily at last report. The company's *Star* zinc mine at Burke, also in Shoshone County, was operating at capacity.

Three claims have been filed in the Beauty Bay area of Lake Coeur d'Alene, Kootenai County, Idaho, by W. L. T. *Uranium and Mineral Company* of Kellogg. Good radioactivity was reported. Company members are Don E. Lawrence, I. and Merlin E. Wood, James Linn, Robert E. Tullis and Robert L. Tidwell.

*SS Enterprises*, owned by Jack and Tim Simons of Coeur d'Alene, Idaho has leased ground south of Wolf Lodge on Lake Coeur d'Alene from Phil Murphy for uranium prospecting.

*Idaho Uranium Company* of Pocatello, Idaho, was incorporated for \$300,000 by Harry McDougall and Sorague Hanley, Pocatello, and Thomas D. Nelson, Aberdeen, Washington.

*Alabama-California Gold Mines* has renegotiated a lease and purchase option contract on the *Merry Blue* tungsten mine in central Idaho to give it a half interest. It also is completing negotiations for 24 claims in Washington County, near a mercury producer.

Construction of a small concentrator is planned by *Idaho Goldfields, Inc.*, at its property in Kootenai County east of Coeur d'Alene, Idaho. Of 15 tons daily capacity, the plant would treat oxidized development ore from surface operations. A new type of fine grinder which does not slime ore would replace the customary ball mill. Direct smelter shipments of lead-silver-gold ore last year by lessees did not prove profitable. L. A. Thompson, Spokane, is president.

A short length of lead-silver ore has been opened on the new 750-foot level of the *Vindicator* mine east of Mullan, Shoshone County, Idaho. Work is being done by *Silver Buckle Mining Company* of Wallace, and *New Park Mining Company*, Salt Lake City, with aid of a DMEA loan.

*Mirror Rock Uranium Company* of Wallace, Idaho has been incorporated for \$400,000 by Alex Bettles, West Los Angeles; Edward L. Anderson, La Jolla, California, and Charles L. Lavery, National City, California.

*Leesburg Uranium Company* of Pocatello, Idaho filed articles of incorporation at Boise. Capitalization was listed at \$100,000 and incorporators are J. E. Tarr and Leo Munk of Pocatello and Billy Worrell of Salmon.

Gordon Leuty and associates of Desmet, Idaho, have found uranium-bearing ore in the Windfall Pass area in Benewah County and considerable land has been leased in the region.

Summer development work is being planned by *Eldo Placer Mining Company* on its seven-claim group in Eldorado Creek meadows southeast of Pierce, Idaho. Preliminary tests last summer indicated monazite-bearing sand at a depth of about 14 feet. Andy Hawkins of Lewiston is president; A. J. Roeben, field manager.

The old *Hidden Treasure* properties, Little Smokey district, Camas County, Idaho, will be searched for uranium this summer by eastern mining interests. Traces of uranium were found last year by miners doing assessment work. Lead, silver, zinc, copper, and gold-bearing rock have been found on the properties. James Allen, Nampa, is handling the properties for the owners, Mrs. Charles J. Sherry, Jr., of Long Beach, California, and Mrs. Martha M. Childs of Los Angeles.

Radioactive sands have been found in the upper Olive Creek Basin, Dixie mining district, Idaho County, Idaho, by Miles Painter and Cletus Kaufmann of Lewiston, operators of a small gold dredge on a 10-claim property. They plan to move in equipment for recovering the sands.

*Silver Syndicate, Inc.*, *Sunshine Consolidated, Inc.*, and *Clayton Silver Mines* have formed a joint venture to prospect for uranium. Each will contribute \$10,000 annually into a joint exploration fund. Clayton Silver will be the operating company. Mineral leases have been obtained on 7,300 acres of state land in Custer County, Idaho and on 433 acres in Lemhi County, Idaho. Norman Smith, chief engineer, is investigating properties in Utah, Wyoming, Colorado, Arizona, and New Mexico.

N. L. Terteling and Son of Boise, Idaho was reportedly high bidder on two units of phosphate lands located about 16 miles northeast of Soda Springs offered by the U.S. Bureau of Land Management. *Monsanto Chemical Company* was high bidder on another unit 10 miles northeast of Soda Springs.

Recently incorporated in Idaho were: *Mineral Products Company* by Edward and Del Dewey of Emmett, Ralph Peyton of Portland, and Paris Martin and Ben F. Stadler of Boise; *Explorations and Development Inc.* by W. H. Langroise, W. E. Sullivan, and Glorian Ledvine, all of Boise; *Newsome Mining Company* by Hubert I. Mariels, Lester F. Blankenship, and Frank Wiser, all of Grangeville.

Production at the *Jack Waite* mine, Duthie, Shoshone County, Idaho has been averaging about 800 tons monthly. Some of the output is direct shipping ore. Lead concentrate and zinc concen-

trate also are produced. The mine is operated by *American Smelting and Refining Company*. Recent development work opened new ore bodies. Robert S. Terhune of Seattle is president of Jack Waite.

## MONTANA

The *Anaconda Aluminum Company*, subsidiary of the *Anaconda Company*, expects to have its first potline in operation this month at its new Columbia Falls, Montana plant. The second is scheduled to go into operation production 30 days later. Present plans call for an output of 20,000 tons of primary aluminum this year; eventual production is estimated at 60,000 tons annually. The parent company, *Anaconda Company*, recently changed its name from *Anaconda Copper Mining Company* because of the many interests the firm now has in other metals besides copper.

The *Roger Pierce* consulting firm of Salt Lake City, Utah has contracted to sink a shaft near Basin, Montana. This operation will be watched with particular interest because it is planned to use the new Cryderman mechanical mucker. This machine is an air-actuated clam shell bucket attached on the end of a pneumatic-piston telescoping boom. The position of the bucket in the shaft bottom is controlled by air cylinders. The machine was developed in Canada, and this is the first known application in the United States. Wilbur Criswell is in charge of the operation.

## WASHINGTON

*Bear Creek Mining Company*, a subsidiary of *Kennecott Copper Corporation*, has started a drilling campaign for copper and other metals in the Miners' Ridge area near Darrington, Snohomish County, Washington. Supplies were taken in by helicopter because of snow-blocked trails in the Cascade Mountains. Exploratory work was carried on last summer. Twenty-seven men are scheduled to work this season.

Earle B. Gibbs, Colville mining man, doing business as *Bonanza Lead*, has taken over operation of *Chevelah Copper Company's* properties at the old *Eagle Mountain* copper camp in Stevens County under a profit-sharing agreement. He plans construction of a sorting belt, crusher, sink-float plant, and other milling machinery. For the time being, ore is being trucked to Gibbs' *Bonanza* flotation mill near Colville.

The old *Sunset Mining Company* property on the north fork of the Skykomish River, Snohomish County, Washington, is being worked by 25 men. It is an operation of *Granby Consolidated Mining, Smelting and Power Company, Ltd.*

The U.S. Atomic Energy Commission is test drilling the autunite discovery made last winter on the Alfred L. Dahl

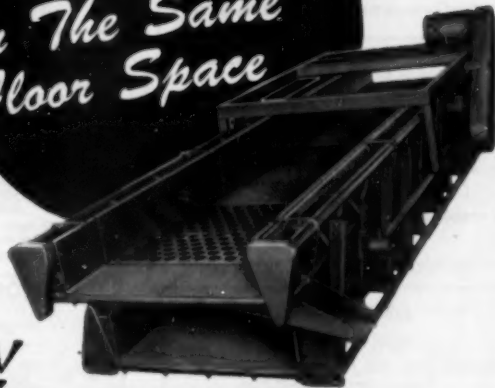
ranch in the western foothills of Mount Spokane, Spokane County, Washington. Officials of *Daybreak Uranium, Inc.*, which has the property leased, report that the first hole was put down in ore. Drill site was a bulldozer cut made through the ore-bearing structure. An estimated 50 tons of shipping grade material was piled up in making the cut. James W. Fox, Opportunity, is company president.

*Dawn Mining Company*, a subsidiary of *Newmont Mining Corporation*, is driving a short test tunnel at the *Midnite* uranium mine on the Spokane Indian Reservation in southwestern Stevens County, Washington. Objective was ore found in a diamond drill hole put down from the surface by the AEC. The new

firm, which took over operations April 21 under an agreement with *Midnite Mines, Inc.* (see *Mining World*, June 1955, page 93), installed a 500-cubic-foot Diesel air compressor, drilling machine, ore cars, mucking machine, track, water and air lines, and other equipment. It also resumed ore shipments from the original discovery cut. The company also plans to continue diamond drilling started by the AEC. The government agency drilled 13 holes to check geology. Results have not yet been released. Work is under the direction of Robert J. Hundhausen, general manager, formerly a bureau of mines engineer in Spokane.

Okanogan County, Washington is experiencing a flurry of interest in uranium. At last report, claim stakers were most

Twice The  
Screening Area  
In The Same  
Floor Space



with

**SYNTRON**

## Counter Balanced • Dual Deck VIBRATING SCREENS

Extra length, dual deck screening for bigger tonnage production that uses no larger working area than a single screen. Syntron Dual Deck Screens scalp, coarse size and grade in one complete operation.

Compulsory driven, swinging mass type units that do not slow down under sudden load surges—require less power to operate. Are easy to install.

...and for increased mining profits

### PULSATING MAGNET SCREENS

For heavy tonnage sizing and scalping.

Replaceable screen surface. Controllable speeds.



### TEST SIEVE SHAKERS

High speed, accurate sizing of test samples. Positive control of time and speed.

### ELECTRIC VIBRATORS

Assure a positive free flow of stubborn materials through bins, hoppers or chutes.



### POWER CONVERSION UNITS

Complete a-c to d-c power conversion, ready to operate in capacities up to 300 kw.



Send for complete  
catalogue data—FREE

**SYNTRON COMPANY**  
166 Lexington Ave.      Homer City, Penna.



# PROFESSIONAL DIRECTORY

One-Inch Card, \$50 Yearly—1/2-Inch, \$35 Yearly. Payable in Advance.

## CONSULTING ENGINEERS:

**Philip J. Baukol** Member ASME, ASCE  
Reg. Mechanical Engineer  
DESIGNER OF PLANTS  
• INDUSTRIAL • METALLURGICAL •  
2131 University Ave. Berkeley 4, Calif.

**COWIN & CO., INC.**  
Mining Engineers and Contractors • Consulting  
Appraisal Reports • Shaft & Slope Staking • Mine  
Development • Mine Plant Construction.  
1-18th Street, S. W. Birmingham, Ala.  
Phone 56-5566

**DICKINSON LABORATORIES**  
Assayers—Chemists—Metallurgists—Umpires  
Shippers Representatives at Local Smelters  
Representatives at Mexican Border  
Points for Shippers of Manganese and Fluorspar  
1300 West Main Street El Paso, Texas

**PHILIP L. JONES**  
Consultant  
Mineral Economics & Mineral Drawing  
Heavy Metals Specialist  
405 Miners Bank Bldg. Tel. Mayfair 3-7161  
Joplin, Mo.

**C. P. KEEGEL**  
Mining & Metallurgical Engineer  
Administration Appraisal  
707 S. 6th St. Tel. 571  
Las Vegas, Nevada

**ARNOLD H. MILLER**  
CONSULTING ENGINEER  
General Mine, Mill and Industrial Appraisals,  
Plant Design, Mechanization.  
Cables: "ALMIL" Tel. Cortland 7-0635  
120 Broadway New York City 3, N. Y.

**MURPHY, F. M.**  
Consulting Mining Geologist  
1201 Maryland Parkway, Las Vegas, Nev.

**RODGERS PEALE**  
Consulting Mining Geologist  
315 Montgomery St. San Francisco 4, Calif.

**WILLIAM J. SHEDWICK, JR.**  
Mine and Geologic Reports  
Mexico and Latin America  
New Jersey License 2744-a  
Baltimore 20-302 Mexico 1, D. F.

**URANIUM EXPLORATION**  
Mining, Geology, Reports, Surveys  
**GEO-ENGINEERING**  
Louis P. Gaggini, Lewis D. Anderson,  
Harold A. Culp & Associates  
Harwood, Colo. Grand Jct., Colo.  
PO Box 223 204 Main Street  
Phone: 99 Phone: 2663

**ARTHUR R. STILL**  
Consulting Mining Geologist  
Room 24, Union Block Prescott, Arizona

**MARVIN J. UDY**  
Inorganic Chemistry Electrochemistry  
Electric Furnace Smelting  
Process Metallurgy  
Ferro-Alloys, Calcium Carbide, Phosphorus  
546 Portage Road Telephone 2-6294  
NIAGARA FALLS, N. Y.

**MILL DESIGN & CONSTRUCTION**  
Send for Free Bulletin  
O. W. WALVOORD CO.  
401 High Street • Denver, Colorado

## CHEMISTS, SAMPLERS, SHIPPERS' REP'S:

**ARIZ. TESTING LABORATORIES**  
CLAUDE E. McLEAN, REGISTERED ASSAYER  
Analytical and Consulting Chemists  
Box 1888 817 W. Madison St. Phoenix

**B. W. DEASON V. E. WORSLEY**  
**BLACK & DEASON**  
Assayers and Chemists  
Ore Shippers Represented at all Smelters  
P. O. Box #1888 Salt Lake City, Utah

**THE COLORADO ASSAYING CO.**  
ASSAYERS, CHEMISTS, and  
SPECTROGRAPHERS  
Est. 1900  
Gold, Silver each \$1. both \$1.50, Copper  
75c. Send for Free Copy of our Mineralogist's  
Pocket Reference Giving Detailed  
Information on All the Principal Ores.  
2013 WELTON ST., DENVER 1, COLORADO

**T. G. Deggendorfer**  
Shippers' Representative  
Control Assays  
Box 840 Kellogg, Idaho

**GOODALL BROTHERS**  
ASSAYERS AND CHEMISTS  
SHIPPERS' REPRESENTATIVES  
Helena Established 1909 Montana

**HANKS, INC., ABBOT A.**  
ASSAYERS AND CHEMISTS  
Supervision of Sampling at Smelters  
Spectrographic Analysis  
624 Sacramento St. San Francisco 11

**HAWLEY & HAWLEY**  
W. E. HAWLEY, Mgr.  
Assayers, Chemists, Ore Buyers  
Shippers' Representative  
P. O. Box 1060 Douglas, Arizona

**LEDoux & COMPANY**  
Florida Spectroscopists Assayers  
Shipping Representatives at Smelters and Refineries in  
the United States  
Mine Examination Analysts  
359 Alfred Avenue Teaneck, New Jersey

**Wood Assaying Co., Henry E.**  
Established 1878  
ASSAYERS and CHEMISTS  
733 W. Colfax Denver 4, Colorado

## SMITH-EMERY COMPANY

Established 1910

Assayers—Chemists  
Metallurgists  
Spectrographers  
Shippers' Representative.

Price List on Request

781 East Washington Blvd., Los Angeles, Calif.

## PRODUCTS AND SUPPLIES:

### VAN WATERS & ROGERS

Flotation Chemicals, Mining Reagents  
Largest and Most Complete Stocks  
in Northwest  
Seattle, Spokane, Portland, Boise

## DRILLING COMPANIES:

**NEW YORK-ARIZONA DEVELOPMENT CORP.**  
Diamond Core Drilling  
614 Mayer-Heard Building Box 347  
Phoenix, Arizona Globe, Arizona  
Phone Aline 2-8614

**MOAB DRILLING COMPANY**  
Diamond Core Drilling Contractors  
"Uranium Exploration is our Business"  
Albert Hback, Jr., General Manager  
52 E. Central Street Box 387  
Phone 4181 Moab, Utah

**R. S. McClintock**  
**Diamond Drill Company**  
Spokane, Washington—Globe, Arizona

Diamond Core Drill Contractors  
Manufacturer of Diamond Bits  
and drilling accessories

## DIAMOND DRILL

Contracting Company

S. 18 Stone Spokane 15, Wash.

"DIA-HARD" CORE  
BARRELS  
AND

**DIAMOND DRILLING SUPPLIES**

Core and Churn Drill Contractors



## NORTHWEST

active near Ruby, mecca of silver seekers 75 years ago, and Conconully, early-day mining center. Claim filings also had been made on ground in the Methow Valley, on Moses Mountain, on Salmon Creek, near Nighthawk, and near Twisp. Northwest Prospectors Company reported it found 5 percent monazite with some rare earths and uranium on Happy Hill, four miles northwest of Okanogan.

A new strike of high-grade autunite has been made in the western Mount Spokane foothills (Spokane County), 1½ miles northeast of the original Dahl farm discovery. William D. Weaver, general manager of Lands, Inc., made the strike near the surface. Five radioactive springs also have been found on the 141-acre property leased by Weaver. Large crystals of autunite have been uncovered but extent of the deposit had not been determined at last report.

Kimball Mines, Inc. of Spokane, has leased ground west of Newport, Pend Oreille County, Washington from which unidentified but radioactive specimens have been taken. The firm has a lead-silver-gold property near Elliston, Montana. Mrs. Sarah L. Stratton is president.

Pend Oreille Mines and Metals Company has disposed of a \$500,000 stockpile of zinc concentrates at its Metaline district (Pend Oreille County, Washington) property and plans to up production from 1,600 tons daily to 2,400 tons this summer if the market for such concentrates improves. Lewis P. Larsen of Spokane is president.

Lead Trust Mines, Inc. has been organized by F. J. Cardinal, A. H. Singleton, Rodger Daggett, and V. L. Blasing, all of Spokane, Washington, and E. L. Fuller of Medical Lake. Mr. Cardinal, president, has assigned to the firm more than 4,000 acres of state leases taken for uranium prospecting, the four-claim Lead Trust Extension prospect, and the three-claim Idaho group in northern Stevens County.

Germania Consolidated Mines, Inc. has resumed mining and milling operations at its tungsten mine in southwestern Stevens County, Washington. Work was suspended for two months because of road restrictions. Uranium exploration work also is under way. Julius A. Franz of Lind is president.

**We Cordially Invite Your Inquiry** regarding our present availability to sell your metal and mineral ore productions  
Selling Agents  
Dept. M, 450 Seventh Ave., New York 1, N. Y.  
G.P.O. Box 9437, New York 1, N. Y.  
COSMOPOLITAN SALES COMPANY  
BRyant 9-5481

### BALL MILL FOR SALE

Complete plant about 45 ton capacity consisting of:

4' x 5' Struab DB Ribcone ball mill,  
Akins Screw type classifier,  
9" Jaw Crusher,  
Denver 4 roll flotation machine,  
Overstrom table,  
Waukesha engine with line shaft and pulleys,  
etc.,

Also Cat Sixty tractor and farm tractor,  
Miscellaneous items.

Any reasonable offer considered. For particulars write:

P. O. Box 1100  
Helena, Montana

### BALL MILL FOR SALE

COMPLETE 50-TON BALL MILL  
EQUIPMENT AT AMALIA MILL,  
CALIENTE, CALIFORNIA.

Address Inquiries to

Ray McDonald  
4516 Greenwood Ave.  
Seattle 3, Washington

- 1—390 cfm 75 hp Sullivan "Unitair" compressor
- 1—36" 15' Wemco spiral rig classifier
- 1—6' x 22' Dorr DSF rig classifier
- 1—6' x 4½' Allis-Chalmers ball mill
- 1—5 x 7' Eimco conehead ball mill
- 1—9 x 30 Telesmith jaw crusher
- 1—18 x 24 Blake type jaw crusher
- 1—10 x 20 Allis-Chalmers jaw crusher

F. J. Sullivan

1139 Holman Road  
Oakland 10, California  
TWineaks 3-8342

**FEDERAL  
PIPE &  
TANK  
CO.**

**—WOOD PIPE and WOOD TANKS—**  
Factory  
and Main Office  
6851 E. Marginal Way  
Seattle 8, Wash.

### LIQUIDATION SALE

- 1—Sweetland Filter, #5
- 1—Bird Contin. Centrifugal 24"
- 1—L-B Skip Hoist, 48 TPH
- 2—Shepard-Niles 4-ton Monorail Cranes with ¼ yd. bbls.
- 2—Trough Belt Conveyors—85', 123' L
- 3—Pan Conveyors—36', 83', 180' L
- 4—Drag Conveyors, up to 120' L
- 16—Bucket Elevators—20' to 60'
- 5—Rotary Kilns 7' x 60', 5' x 30', 10' 6" x 105'
- 1—Ball Mill 6' D x 16' L
- Also—Bins—Blowers—Pumps—Motors, etc.

Our Mr. Betz on premises—

Mutual Chemical Co. plant  
201 West Side Ave.—Jersey City, N. J.  
(Phone Henderson 3-2161)

### LIQUIDATION BY

**PERRY EQUIPMENT CORP.**

1439 N. 6th St. Phila. 22, Pa.

### TUNGSTEN

Domestic concentrates, middlings, or ore cobblings of scheelite, hubnerite, ferberite, or wolframite wanted for purchase or custom treatment.

Write

Mineral Recovery and Engineering Co.  
P.O. Box 476 Wallace, Idaho

### BUSINESS MEN'S CLEARING HOUSE

601 MIDLAND SAVINGS BUILDING  
DENVER, COLORADO

52 years of world-wide placement service for all classes of executive, engineering, operating, etc., mine and mill men

FILE YOUR APPLICATION WITH US

### LARGEST MILL STOCKS

#### BALL MILLS

- 20—86 Marcy
- 4—96 Marcy
- 4—5 x 14 Marcy
- 5—5 x 10 AC Rod
- 1—8 x 36 Hardinge
- 1—7 x 36 Hardinge
- 1—6 x 6 Hundy
- 2—5 x 6 AC
- 1—4 x 5 C.I.W.
- 1—4½ x 7 C.I.W.
- 1—3 x 3 Stearns-Roger

#### FEEDERS

- 7—Apron 30" x 5'
- 1—Apron 36" x 7'

#### JIGS

- 1—16 x 24 Deco Duplex
- 1—12 x 18 Deco Duplex
- 1—8 x 12 Deco Simplex

#### CLASSIFIERS

- 5—4' x 21" Berr DSFN
- 1—6' x 26" Berr DSFN
- 2—6' x 26" Berr 12' Berr Bowls, DSFN
- 14—6' x 23" Berr BSD
- 1—48" x 19" Hirsch Spiral
- 1—24" x 10' Akins Spiral

#### WEIGHTOMETERS

- 17—Merrick Model E 20" Belt

#### LARGE BLOWERS

- 4—G.E. 30,000 cfm at 5.6 lbs.
- 1—18 60,000 cfm at 5 lbs. with 1735 HP motor

#### JAW CRUSHERS

- 1—28 x 36 Traylor Balldog
- 1—10 x 21 BB Telesmith
- 1—10 x 30 Pacific KN

PLUS complete stock of sand pumps, conveyors, reagent feeders, conditioners, etc.

WRITE US FOR ALL YOUR NEEDS

**MACHINERY CENTER, INC.**

808 Newhouse Bldg.

Phone: 3-3973

Salt Lake City 11, Utah

# THE MARKET PLACE

SELECT YOUR EQUIPMENT NEEDS FROM THE LARGE STOCK OF DEPENDABLE RECONDITIONED MACHINERY.

## FLOTATION MACHINES

- 1-New Morse "Jelair" 8 cell #7
- 1-New Morse "Jelair" 2 cell #7
- 1-Pagogen Single cell
- 1-4 cell 15" Stearns-Roger
- 2-8 cell Denver "Sub A" #21

## FILTERS

- 1-3' x 3' Drum Filter
- 2-4' x 2' Morse Drum Filters
- 1-6' 2-disc American Filter
- 1-6' 3-disc American Filter
- 1-18" Morse Round Pattern Filter Press
- 1-36" Merrill Triangular Filter Press
- 1-12" Sweetland Filter Press, 36 leaves

## BALL & ROD MILLS

- 1-4' x 3' Marcy Ball Mill
- 1-4' x 3' Morse Ball Mill
- 1-4' x 4' Marcy Ball Mill
- 2-6' x 48" Hardinge Conical Ball Mills
- 1-8' x 22" Hardinge Conical Pebble Mill
- 1-3' x 8' Marcy Rod Mill
- 1-3' x 9' Ruth Rod Mill

## COMPRESSORS

- 1-64 CFM Gardner-Deaver, 4 1/2" x 4"
- 2-68 CFM Ingersoll-Rand, 7" x 5"
- 1-121 CFM Gardner-Deaver, 8" x 8"
- 1-173 CFM Chicago-Pneumatic, 9" x 8"
- 1-173 CFM Ingersoll-Rand, 9" x 8"
- 1-179 CFM Ingersoll-Rand, 12" x 10"
- 1-213 CFM Blaisdell, 14" x 9" x 8"
- 1-230 CFM Gardner-Deaver, 6" x 4 1/2" x 5"
- 1-447 CFM Ingersoll-Rand, 14" x 7 1/2" x 12"
- 1-437 CFM Sullivan, 14" x 9 1/2" x 10"
- 1-888 CFM Union, 18" x 12"
- 1-800 CFM Ingersoll-Rand, 18" x 11" x 10"
- 1-840 CFM Laidlaw, 13" x 10"
- 1-1410 CFM Ingersoll-Rand 24" x 13" x 16"
- 1-230 CFM Gardner-Deaver Model WBQ, driven by Buick 8 cylinder Gasoline engine, Skid mounted

## LOCOMOTIVES

- 1-2 1/2 ton Whitcomb Battery, 24" gauge
- 1-2 1/2 ton Jeffrey battery or trolley, 36" gauge
- 1-3 1/2 ton Mancha battery, 24" gauge, with 2 sets Edison batteries and charging set
- 1-4 ton Ironton battery, 36" gauge
- 2-7 ton General Electric permissible battery, 36" gauge
- 1-7 ton Atlas battery, 36" gauge
- 3-3 ton Ironton battery, 36" gauge
- 2-8 ton General Electric battery, 36" gauge
- 4-10 ton Atlas battery, 36" gauge
- 1-3 ton Whitcomb gas engine driven, 24" gauge
- 1-4 1/2 ton Goodman trolley, 36" gauge
- 1-5 ton Jeffrey trolley, 36" gauge
- 1-8 ton Goodman trolley, 36" gauge
- 2-8 ton Goodman trolley, 36" gauge

## TUGGERS AND SLUSHERS

- 1-Ingersoll Rand, model SHC Single Drum Air Tugger
- 1-5 H.P. Browne, Single Drum Electric Tugger
- 1-5 H.P. Sullivan Single Drum Electric Tugger
- 1-7 1/2 H.P. Sullivan Double Drum Electric Slusher
- 2-10 H.P. Sullivan Three-Drum Electric Slushers
- 2-5 1/2 H.P. Sullivan Single Drum DC Electric Tuggers
- 5-6 1/2 H.P. Sullivan Double Drum DC Electric Slushers
- 1-10 H.P. Sullivan Two Drum driven by Continental 4 Cyl. Gas Engine.

## THICKENERS & CONDITIONERS

- 1-24" diameter Dorr Lowhead Thickener
- 2-10" diameter Morse Bros. Thickeners
- 1-4' x 4' New Morse Conditioner

## CRUSHERS

- 4-2 1/4" x 3 1/2" New Morse Lab Jaw Crushers
- 5-4" x 6" New Morse Lab Jaw Crushers
- 2-8" x 15" Whooling Jaw Crusher
- 1-8" x 15" Farrell Jaw Crusher
- 1-8" x 24" Rogers Jaw Crusher
- 1-8" x 36" Universal Jaw Crusher
- 1-11" x 18" Universal Jaw Crusher
- 1-24" x 12" Farrell Jaw Crusher
- 1-10" x 16" Hercules Jaw Crusher
- 1-10" x 16" Universal #3M Jaw Crusher
- 1-20" x 36" Austin-Western Jaw Crusher
- 1-36" x 48" Jeffrey Flextooth Crusher
- 1-28" x 18" Williams Hammermill
- 1-30" x 17" Williams Hammermill

## VIBRATING SCREENS

- 1-24" x 36" New Universal Single Deck
- 3-3' x 5' Tyler "Hummer" Single Deck
- 1-42" x 72" New Universal Single Deck
- 1-42" x 72" New Universal Single Deck
- 1-42" x 72" Jeffrey-Traylor Single Deck
- 1-42" x 98" Jeffrey-Traylor Single Deck
- 1-3' x 6' Simplicity 3 Deck
- 1-4' x 12' Symons Double Deck
- 1-4' x 12' Tyler "Ty-Rock" 3 Deck

## FEEDERS

- 1-10" x 36" Jeffrey Type 2A Vibrating Feeder
- 1-36" x 36" Jeffrey #4 Vibrating Feeder
- 1-30" x 42" Type FO Vibrating Feeder
- 1-Jeffrey
- 1-3' x 5' Hardinge Volumetric Belt Feeder
- 1-12" x 6" New Morse "Vari-Stroke" Ore Feeder
- 2-12" New Morse Wet Reagent Feeders
- 1-New Morse Cone Type Dry Reagent Feeder

Serving the World's Mining Regions since 1898.

# MORSE BROS. MACHINERY COMPANY

2900 Brighton Blvd.

Denver 1, Colorado

**AIR COMPRESSORS—ELECTRIC**  
18 INGERSOLL RAND PRE-2—3564", 3040", 2200", 1568", 1302", 1092", & 878", 2300 & 440 V.  
**TUNNEL MUCKERS**  
17 KIMCO 102, 40, 21 & 12-H.

**TUGGER & SLUSHER ELEC. HOISTS**  
22—2 & 3 DRUM, 10, 15, 25, 50 & 60 H.P.  
**AIR TUNNEL LOCOMOTIVES**  
2 MODEL 401 KIMCO NEW 1954.

**2 JAW CRUSHERS**  
48x60 Traylor—40x52 Allis-Chalmers

**8 VIBRATING SCREENS**  
1—2—3 DECK 4x5, 4x8 & 4x12.

**FLOTATION MACHINES**  
20 PAGROGEN 44" & 56"—12x8 KRAUT 15 H.P.

**CLASSIFIERS**  
1—8"x31"x24" Dorr Bowl & 3—8"x34" Bahr  
20"x8" Dorr Hydroseparator.  
3"x19"x3" Wemco Spiral.  
22 Dorr & Wemco 18", 10", 20", 24", 26", 36", 80" & 100" Dia. Steel & Wood Tanks.  
4'6"x26"x10", & 3'x24"x12" Wemco Bowl.  
3'x24"x10"x10" Dorr Turret Bowl.  
46"x36"—3 Tray Dorr, 4 Compl.

**SINK FLOAT MILL**  
Wemco size 1 WKK (TKM) Model 5/25 TPH.

**48 BALL, ROD & TUBE MILLS**  
10"x48", 8"x48", 6"x22", 6"x20", 6"x36", 3"x7", 4"x3", 4"x3", 4"x14", 6"x10", 8"x14", 5"x10", 6"x3", 6"x8", 6"x8", 6"x10", 7"x5", 7"x5", 7"x5", 8"x13", 8"x9", & 30"x54".

DARIEN, 60 E. 42nd St., N.Y., N.Y.

Building and Equipment for  
**100 TON MILL**  
**FOR SALE**

**STRUCTURAL STEEL BUILDING**

Conveyors—Bucket Elevators  
—Sand Pumps—2 Rotary  
Dryers—6 Deister Tables—  
3 Wetherill Type 6 Pole Mag-  
netic Separators—Electric Mo-  
tors—315 Ft. Portable Com-  
pressor and many other items.

THE  
**TAYLOR-KNAPP COMPANY**  
CALIFORNIA DIVISION

Box 245, Tracy, Calif. Phone Tracy 284

**TONOPAH EXTENSION  
MINES INC. HAS FOR  
SALE ITS VICTOR SHAFT  
STEEL HEAD FRAME**



Height to center of Sheave 105'. Overall Height 123'. Location—Tonopah, Nevada. Excellent condition. Address John Connolly, Tonopah, Nevada or Tonopah Extension Mines, Inc., 10 West 2nd Street, Reno, Nevada.

Prices and Information Available on Request

Grind Your Ore  
PROPERLY WITH A SELF-CLASSIFYING  
**NONSLIMING  
BALLMILL**  
We Mfg. Other Mining  
Machinery  
**WHEELER MFG. CO.**  
4673 Algor, L. A. 28 CH-51713

**ROD MILL:** 4 1/2 x 10 ft. with new liners.  
**CRUSHING ROLLS:** 24x10" Allis-Chalmers  
**THICKENER:** 28x10 Dorr Ty. A w/steel tank  
**CRUSHER:** 15x24 Cedar Rapids roller-brg  
**CRUSHERS:** 2 Kuo-Kuo 10x24 Model 50.

Paul F. Smith  
39 W. Adams St. Phoenix, Arizona

## THE MARKET PLACE

### ALLISON STEEL MANUFACTURING COMPANY

Mine and Mill Buildings  
• Mine Rails • Ore Cars •  
Steel Gallows Frames • Ball  
Mills • Muck Plates • Cru-  
cible Drill Steel

We offer a complete repair  
service to the Mining Indus-  
try. Our new Machine Shop  
is equipped to handle your  
work quickly and economi-  
cally.

*Hot Milling of All Types of  
Detachable Bits*

**SOUTH 19TH AVENUE  
PHOENIX ARIZONA  
PHONE Alpine 8-7731**

#### RECTIFIERS MOTOR GENERATORS CONVERTERS

All Makes—All Sizes—All Voltages  
**ELECTRIC LOCOMOTIVES**

(Trolley & Battery)  
All Makes—All Weights—All Gauges

**Wallace E. Kirk Company**  
7025 Penn. Ave. (MW) Pittsburgh 8, Penna.

#### CLASSIFIED SECTION

8 pt. type 12c per word. 10 pt. type  
18c per word. Minimum charge  
\$4.50.

(For Box numbers addressed to  
Mining World, add 50c)

Boxed ads (display) in either Market  
Place or Classified Sections—\$7.50  
per column inch.

(See Market Place Section for lower  
contract rates).

Closing Date: If proof required, 1st  
of preceding month, otherwise 10th.

<b>Market Place</b>	360 inches	.....	<b>\$5.50</b>
	180 inches	.....	<b>\$6.00</b>
<b>Advertising</b>	90 inches	.....	<b>\$6.50</b>
	45 inches	.....	<b>\$7.00</b>
	Less than 45 inches	.....	<b>\$7.50</b>

Contract rates based on local number of column inches used within one year.  
30 column inches equal one page.

Closing date: 1st of month preceding publication.

(Used and reconditioned equipment, liquidations, property sales only)  
For additional 10,000 WORLD MINING export distribution: Add 50%

#### POSITIONS OPEN

MINE SUPT., E. W. fgn.	.....	\$12,000
ASST. MINE SUPT., U.S.	.....	house & \$600
ASST. MINE SUPT., E. W. (2) fgn.	.....	\$550
GEOLOGISTS (2) mining exp.	.....	\$350-\$550
ASST. CHIEF, engr. const. mtos. fgn.	.....	\$750
MINE foreman, fgn., (2)	.....	\$435-\$550
JR. MINE engr. open pit	.....	start \$385
MINE SHIFT boss, U.S.	.....	\$450
JR. MINE ENGR., fgn. & U.S.	.....	\$400
MINE f'man, E. W. or practical, fgn.	.....	\$450
ASST. MILL supt., E. W. fgn.	.....	to \$750
GEN'L. MILL f'man, fgn. E. W.	.....	\$450
MAINTENANCE mill, smelter, fgn.	.....	\$500-\$600
DESIGNERS, elect. mech. Denver	.....	to \$500
DRAFTS, mine, mill, fgn.	.....	\$600
DRAFTS, mine, mill, Cal.	.....	\$450
METALGISTS (2) mill & kiln exp.	.....	\$6-\$6,600
METALLURGIST or chem. engr. S. W.	.....	\$440
MET. ENGR. mech. or crusher exp. fgn.	.....	\$5-\$600
METALLURGIST, chem. or pyro. exp.	.....	OPEN
ENGR. or physicist, explosives research	.....	\$500
REVERB. & converter f'man, fgn.	.....	\$500
MECH. engr. supt. testing lab. U.S.	.....	\$600
ENGRS. met. chem. mech.	.....	\$378-\$700
MECH. ENGR. & R. exp. fgn.	.....	\$400-\$500
MECH. ENGR. mine exp. fgn.	.....	\$800
MECH. ENGR. concentrator, U.S.	.....	OPEN
ASST. CHIEF MECH. engr. fgn.	.....	OPEN
PROJECT engr. metal extrusion	.....	OPEN
ENGR. electrical supt. mine, fgn.	.....	\$675
ELECT. mech. supt. mine, U.S.	.....	\$600
ELECT. ENGR. metal prod'n, U.S.	.....	OPEN
SUPT. elect. mtos. Bat. mill	.....	\$600
ELECT. ENGR. electronic	.....	\$400-\$500
CHIEF POWER plant opr. fgn.	.....	\$650
ASST. MASTER mech., fgn.	.....	\$550
MASTER MECH. mine, fgn.	.....	\$500
CHIEF, ENGRS. (2) research & deprivt.	.....	\$550-\$600
CHIEF, or met. engr. (2) kiln exp.	.....	\$550
CHIEF, CHEMIST, fgn.	.....	\$800
CHEMISTS, U.S.	.....	\$400
MINE ELECTRICIANS, U.S., \$450; fgn.	.....	\$500
ASSAYERS, fgn., \$350; U.S. (2)	.....	OPEN
CIVIL ENGR. U.S. exp. fgn.	.....	\$500
JR. ACCOUNTANT, mine, fgn.	.....	\$400 UP

#### GLENN B. WILSON EMPLOYMENT SPECIALISTS

306-310 Boston Bldg., 828-17th St.  
Denver 2, Colorado

**POSITION OPEN:** Sales engineer to  
cover mining and construction accounts.  
Knowledge of rock drilling procedures  
and mining equipment applications  
essential. Location Pacific Northwest.  
Reply Box G-3, stating qualifications,  
121 Second Street, San Francisco 5,  
California.

**FOR SALE:** 500 cf Gardner-Denver com-  
pressor with 13,000 Cat Diesel Mounted  
6-wheel White Truck. Priced for quick  
sale. Box 1065. Redwood City, Cali-  
fornia.

**FOR SALE:** Large Williams Hammer  
mill and parts. Complete and ready to  
run. Piggott Projects, 1057 Howard  
Street, San Francisco, California.

**MICA MINE FOR SALE:** Four claims  
containing book, punch and scrap mica  
in large pegmatite. Accessory minerals  
—Columbite, Tantalite, Samarskite and  
Beryl. New mill under construction five  
miles from the property over good road.  
Frank Onstott, General Delivery,  
Grants Pass, Oregon.

**DREDGE:** 10" suction with cutter head.  
Automatic re-soiling. 100 yards per  
hour minimum. Terms or participating  
basis. A Johnston, 711 S. E. 11th, Port-  
land, Oregon.

**WANTED:** Chemist or Assayer for anal-  
ytical work on tungsten ores and con-  
centrates. Previous experience neces-  
sary. Location—southeast. Reply Box  
G-2, Mining World, 121 Second Street,  
San Francisco 5, California.

**WANTED:** Mine and mill tailings dump  
to treat. Have dry concentrating process  
and equipment that works well on se-  
veral types of ore. What have you?  
Yewell Research Laboratory, 636 West  
Oro Street, Tucson, Arizona.

**FOR SALE:** Mining property now idle,  
located in Mt. Sneffels district, Ouray,  
Colorado, consists of 11 patented lode  
claims and three patented mill sites.  
For further particulars write Box G-1,  
Mining World, 121 Second Street, San  
Francisco 5, California.

#### URANIUM CLAIMS FOR SALE OR LEASE

Small down payment and royalty basis.  
Must prove up in thirty days.

We have nine (9) square miles of ura-  
nium claims, 35 miles from Las Vegas, on  
paved road and power. Phone: Louis Roth,  
3364-R, Las Vegas, Nevada.

#### MERCURY

Two Cinnabar properties open for deal  
and development. Geology right. Ore  
high-grade and probably to considerable  
depth. Close to road and railroad. Every  
indication of good mercury mines. 150  
miles north of Vancouver.

Edwin Phillips, Goldbridge, B. C., Canada  
Tel. Bridgeriver 135R

**GOLD MINE:** Will sell whole or part in-  
terest in proven California Mother Lode  
gold mine producer. Sale includes active  
corporation stock, some mine equip-  
ment, pipe. Clear title to all claims  
which include quartz and gravel. \$15,000  
will handle. Write Kittie B. Kimball,  
200M Alta Vista Avenue, Grass Valley,  
California or phone Gilbert 2-8240,  
Sacramento, California.



**INDEX OF ADVERTISERS  
IN MINING WORLD**

Agness Miners & Maritime .....	78	Elmer Corp. ....	43	National Malleable & Steel .....	22
Alison-Sherman-Hall Co. ....	78	..... Outside Front Cover		Castings Co. ....	72
..... Inside Front Cover		(World Mining Only)		Naylor Pipe Co. ....	72
Allis-Chalmers Mfg. Co., .....	34	Electric Steel Foundry Co., .....	74	New York-Arizona Development Corp. ....	94
Gen. Machinery Div., .....	WM 4	Engineers Syndicate, Inc., .....	90	Nordberg Mfg. Co. ....	10
(World Mining Only)		Euclid Div., General Motors Corp. ....	26		
Allis-Chalmers Mfg. Co., .....	34				
Tractor Div., .....	97	Federal Pipe & Tank Co. ....	95	Pacific Foundry Co., Ltd. ....	67
Alloy Steel & Metals Co., .....	81			Paale, Rodgers & Co., .....	94
American Cyanamid Co., .....	17	Galigher Co., .....	28	Perry Equipment Corp. ....	95
American Manganese Steel Div., .....	20	General Electric Co., International Inside Front Cover			
American Smelting & Refining Co., .....	43	(World Mining Only)		Radiac Co., .....	78
Smelting Co., .....	59	Geo-Engineering .....	94	Resilio-Lay Co., .....	42
Arizona Testing Laboratories .....	94	Geddy & Co., Inc., E. A., .....	79		
Atlas Diesel Co., .....	WM 16	Goodall Brothers .....	94		
(World Mining Only)		Goodman Mfg. Co., .....	WM 3		
		(World Mining Only)			
				Sanford Day Iron Works .....	30
Baugh, Philip J., .....	94	Hanks, Inc., Abbot A., .....	94	Sawman Bros., Inc., .....	79
Black & Dougan .....	94	Hardinge Co., .....	71	Shedwick, Jr., William J., .....	94
Boyes Bros. Drilling Co., .....	41	Hawley & Hawley .....	94	Simplex Wire & Cable Co., .....	16
Boyes Bros. Drilling Co., Ltd. .....	94	Hawthorne, Inc., Herb J., .....	85	Smit & Co., Inc., Anton .....	41
Bucyrus-Erie .....	3	Hewitt-Robbins, Inc., WM 12, 13		Smith, Paul F., .....	96
Bunker Hill & Sullivan Mng. & Conc. Co., .....	39	(World Mining Only)		..... California .....	33
Business Men's Clothing House .....	95	Industrial Air Products Co., .....	41	Standard Steel Corp., .....	29
		International Harvester Export Co., .....	WM 19	Stearns-Rager Mfg. Co., .....	88
		(World Mining Only)		Still, Arthur E., .....	94
		International Smelting & Refining Co., .....	39	Stoody Co., .....	64
Caterpillar Tractor Co., 4, 5, 12, 13, WM 5		Isbell Construction Co., .....	90	Sullivan, Frank .....	95
(World Mining Only)				..... Engineering Consultants .....	78
Cleveland Rock Drill Div., .....	1	Jeffrey Mfg. Co., .....	6	Syntron Co., .....	93
Westinghouse Air Brake Co., .....	41	Johnson, Herbert Banks .....	78		
Coast Mfg. Co., .....	94	Jones, Philip L., .....	94	Teekay Mines, Inc., .....	96
Colorado Assaying Co., .....	36	Joy Mfg. Co., .....	21, 91	Thomas Flexible Coupling Co., .....	75
Colorado Fuel & Iron Corp., .....	68	Kargel, C. P., .....	94	Timken Roller Bearing Co., .....	31
Sub. of Mine & Smelter Supply Co., .....	40	Kirk Co., Wallace E., .....	97	Tonopah Extension Mines, Inc., .....	96
Columbian Steel Tank Co., .....	34			Traylor Eng. & Mfg. Co., .....	18
Consolidated Pneumatics Tool Co., .....	WM 10	Lake Shore Engineering Co., .....	32		
(World Mining Only)		Ledoux & Company .....	94	Udy, Marvin J., .....	94
Cosmopolitan Sales Co., .....	94	Leschon Wire Rope Div., .....		Ultra Violet Products, Inc., .....	91
Cowan & Co., Inc., .....	94	H. K. Porter Company, Inc. .....	38	Union Oil Co., .....	19
Cummins Engine Co., .....	24, 25	LeTourneau-Westinghouse Co., .....	9, 11	Uranium Enterprises .....	76
Cummins Diesel Export Corp., .....	WM 24, 25	Longyear Co., E. J., .....			
(World Mining Only)		..... Inside Back Cover			
				Van Waters & Rodgers, Inc., .....	94
Dahl, L. N., .....	95	Machinery Center, Inc., .....	95		
Darton Corp., .....	94	Magma Copper Co., .....	59	Welvoerd, Inc., O. W., .....	94
Deggenmarter, T. G., .....	94	McClintock, E. S., .....	94	Wedge Wire Corp., .....	90
Deister Concentrator Co., .....	23	McDonald, Ray .....	94	Western Machinery Co., .....	14, 15
Dever Equipment Co., .....	22	Melander Engineers, Inc., .....	78	Western Rock Bit Mfg. Co., .....	62
Diamond Drill Contracting Co., .....	86	John F., .....	94	Wheeler Mfg. Co., .....	96
Diamond Tool Research Co., .....	86	Merrick Scale Mfg. Co., .....	40	Wilfay & Sons, Inc., .....	94
Dickinson Laboratories .....	94	Miller, Arnold H., .....	94	..... Outside Back Cover	
Dorr-Oliver, Inc., .....	66	Mine Safety Appliances Co., .....	68	A. R., .....	94
Dow Chemical Co., .....	27	Mine & Smelter Supply Co., .....	95	W. H., .....	78
..... of Hammers & Co., .....	30	Mineral Recovery & Eng. Co., .....	94	Wulf, Harry J., .....	78
		Moog Drilling Co., .....	96	Wood Assaying Co., .....	94
		Morse Bros. Machinery Co., .....	94		
		Murphy, F. M., .....	96		

Excellent gold placer prospect in British Columbia. Not yet drilled but Kirk-Hillman "Prospector" drill and tractor available for rent within few miles of property. Have samples and aerial photographs. W. Tait, 1451 Balfour Avenue, Vancouver 9, British Columbia, Canada.

**SALE OR LEASE:** Manganese mill, Aguila, Arizona. Will sell one diesel like new—135 hp, 75 kilowatt. Over-ride generator. Can be seen Thomas Milling Company, Aguila, Arizona. Call TErmiinal (San Pedro, Calif.) "22540." After 6 p.m. TErmiinal 2221.

**FOR SALE:** Large perlite deposit for sale.  
For information write William Stuart,  
1268 Sierra Street, Reno, Nevada.

**FOR SALE**  
Large group of developed lead-silver  
mining property. Open for inspection.  
119 South Knox St.      Denver, Colo.

Large group of developed lead-silver mining property. Open for inspection.  
119 South Knox St. Denver, Colo.

**FOR SALE:** 29 Uranium claims. Located in Thompson mining district—14 miles from Moab, Utah—joining Thornburg's. Will consider small down payment or drilling program. Contact or write Floyd Bowers, Gypsum, Colorado.

**FOR SALE:** I have 1900 acres Appalachian or Cumberland mountain plateau coal land for sale. Contact J. E. Cole, 424 Freeze Street, Cookeville, Tennessee. Phone 887.

**OPENINGS AVAILABLE AT LONG  
ESTABLISHED MEDITERRANEAN  
COPPER PROPERTY  
ASSISTANT CONCENTRATOR  
SUPERINTENDENT**

Age limit about 45. Must be graduate metallurgist having operating experience and with aptitude and experience in laboratory research and process development. Heavy sulphide ore experience desirable. Qualified to succeed to superintendency.

**ASSISTANT MINE  
SUPERINTENDENT**

**JOHN KENNEDY**  
For a job in a hot copper project in Mediterranean. Requires man with excellent broad mining engineering training. Some operating experience necessary. Age 30-42 must be tactful and adaptable. Forward with initial reply complete educational and experience record, list of references, age, marital status, number and age of children, photo (optional). Company offers three year contract, furnished house, transportation self and family, liberal vacations. Excellent climate, medical and dental facilities and hospital facilities, school for 14 years. Non-contributory pension plan. Salary open.

### ASSISTANT CHIEF ENGINEER

**ASSISTANT CHIEF ENGINEER**  
Age limit 45 preferably above 35. Must be graduate mechanical, chemical or civil engineer with natural mechanical ability, excellent practical and supervisory and some construction experience, for charge under Chief Engineer of all shops, foundry, mobile equipment including loading, marine, railway and construction; maintenance and repair of all types of equipment; 7250 KVA diesel generating plant.

### MINE MASTER MECHANIC

Age limit 48. Should be competent supervisor with practical ability required to operate local mine shops and surface equipment and to routinely maintain surface and underground equipment. Local facilities backed up by heavy duty general shops for major repairs.  
Reply to Box E-3, Mining World, 121 Second Street, San Francisco 5, California.

**POSITION WANTED:** Metallurgical plant draftsman. Long experience and technical education. Mine, mill and smelter designer, power plants, wet processing and chemical plants. Structural-mechanical. Rigid frames, arches, welded construction also. D. W. Work, Lamar, Missouri.

**WANTED:** Assayer-chemist with several years' experience for mining company in northwest United States. Salary open. Reply Box E-6, Mining World, 121 Second Street, San Francisco, California.

**WANTED:** Engineer experience in industrial safety work, fire protection matters, plant security arrangements, and related personnel questions. Position entails certain duties in connection with outlying mining operations (largely open-pit). For properly qualified man housing available at nominal rental. Salary open. Write J. B. Knaebel, Manager, Anaconda Copper Mining Co., Grants, New Mexico.

**WANTED:** Young metallurgists or chemical engineers, either recent graduates or with a few years' experience, for process control and experimental test work in metallurgical laboratory pilot plant operated in close liaison with country's largest uranium ore processing plant involving both carbonate and acid leach sections at Bluewater, New Mexico. If interested write direct to J. B. Knaebel, Manager, The Anaconda Company, Grants, New Mexico, giving full details of education, experience, family status, professional interests, availability and salary expected.





*New additions  
to our line!*



*Our new "24"  
Jeep mounted drill*



*The "44" truck  
mounted drill*

## LONGYEAR INTRODUCES THE NEW "W" SERIES DRILL RODS

**New Sizes Accepted as Standard by DCDMA and CDDA**

The E. J. Longyear Company recently announced a complete line of drill rods developed to the new standards adopted by the Diamond Core Drill Manufacturers Association and the Canadian Diamond Drilling Association. Known as the "W" series, these rods will come in EW, AW, BW, and NW sizes. These new standards have now been recommended for world-wide acceptance.

Field tests conducted by Longyear over a period of years indi-

reduces the area between the drill string and the hole wall which permits a more rapid return of sludge.

All Longyear rods, including the new "W" series, are made of cold drawn seamless steel tubing under closely controlled metallurgical conditions, thus assuring a uniform size and wall thickness with more than adequate strength and fatigue resistance for durability and efficient performance under all types of drilling conditions.

Change-over to the "W" series is expected to be gradual. In the meantime, Longyear will also manufacture the old standard E,

UPSET WALL DRILL ROD WITH COUPLING

Size of Rod and Coupling	EW	AW	BW	NW
1/2" of Rod & Coupling	1-3/8"	1-3/4"	2-1/8"	2-5/8"
1 1/2" of Rod	1-1/16"	1-7/16"	1-13/16"	2-5/16"
Hole in Coupling	7/16"	5/8"	3/4"	1-1/8"
Threads per inch	3	3	3	3
Approx. wt. of 10' rod w/coupling	25.0 lbs.	31.6 lbs.	43.1 lbs.	55.3 lbs.

cate several distinct advantages to be provided by the "W" series rods. The over-all increase in size makes for a more stabilized drill string with less vibration and a minimum of ground caving. The increased inner diameter of the rod provides a larger water passage through the drill string and reduces pressure loss. The increased outer diameter

A, B, and N drill rods and will supply the necessary important substitutes.

The new "W" series rods in all sizes are now available for immediate delivery. Specifications of "W" drill rods and couplings can be obtained by writing to E. J. Longyear Company, Foshay Tower, Minneapolis 2, Minnesota, U.S.A.

*We clipped this news story when  
the "W" series was announced*



INTRA-OFFICE MEMORANDUM

TO: Gene Larson

DATE: June 3, 1955

FROM: Mike Gleason

PLACE: New Mexico

SUBJECT: Mobile Units

Dear Gene —

Our new truck and Jeep mounted drills have really put the needed mobility into our contract operations! We can get a rig set up and operating in less than half the time usually needed!

By the way, we've had a lot of comment AND QUESTIONS on the mobile units. If you'll send us a supply of bulletins 24-30 and 44-70, we'll pass them out.

Thanks,

P. S. Right now, we're telling interested parties to write direct to Longyear in Minneapolis.

E. J. Longyear Co. FOSHAY TOWER, MINNEAPOLIS 2, MINN.

**E. J. Longyear Co. MINNEAPOLIS, MINNESOTA**

CANADIAN LONGYEAR LTD., NORTH BAY, ONTARIO • LONGYEAR-ET CIE, PARIS, FRANCE

# *Pioneering in* TACONITE

The future of American industry is closely allied with the economic processing of low-grade iron ore reserves in Minnesota and Michigan. Because of taconite's vital importance, industry is highly interested in the progress of the TACONITE PIONEERS.

Shown here is a typical example of how one taconite pioneer uses Wilfley Sand Pumps to help solve the problems encountered in handling flotation froth . . .

proof again that on even the most difficult applications Wilfley Pumps meet every requirement.

*Individual engineering on every application. Write, wire or phone for complete details.*



**A. R. WILFLEY and SONS, INC.**  
DENVER, COLORADO, U.S.A.  
New York Office: 1775 Broadway, New York City



**WILFLEY  
SAND PUMPS**

European Representative:  
Darr-Oliver Co., Ltd., Abford House, Wilton Road, London, S.W. 1, England